PIT AND QUARRY

LIBRARY OF CONGRESS
MAR 10 1940
PERIODICAL DIVISION

MARCH, 1940

Concentrating Tables Remove Impurities from Silica Sand . . . The Continuous Production of Concrete Joists . . . Missouri Portland Cement Company's New Memphis Gravel Plant

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY

WOVEN WIRE SCREENS

for super-severe service

▼ ▼ ▼

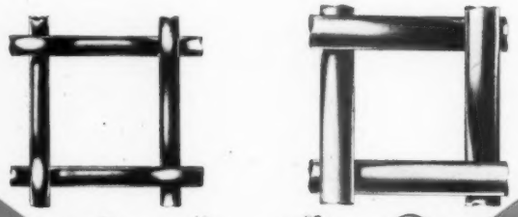
SUPER HARD, SUPER TOUGH,
SUPER STRONG

CONTROLLED TEMPER SUPER LOY SCREENS

withstand abrasion **longer**—

endure vibration **better**—

resist fatigue **to the utmost**



The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

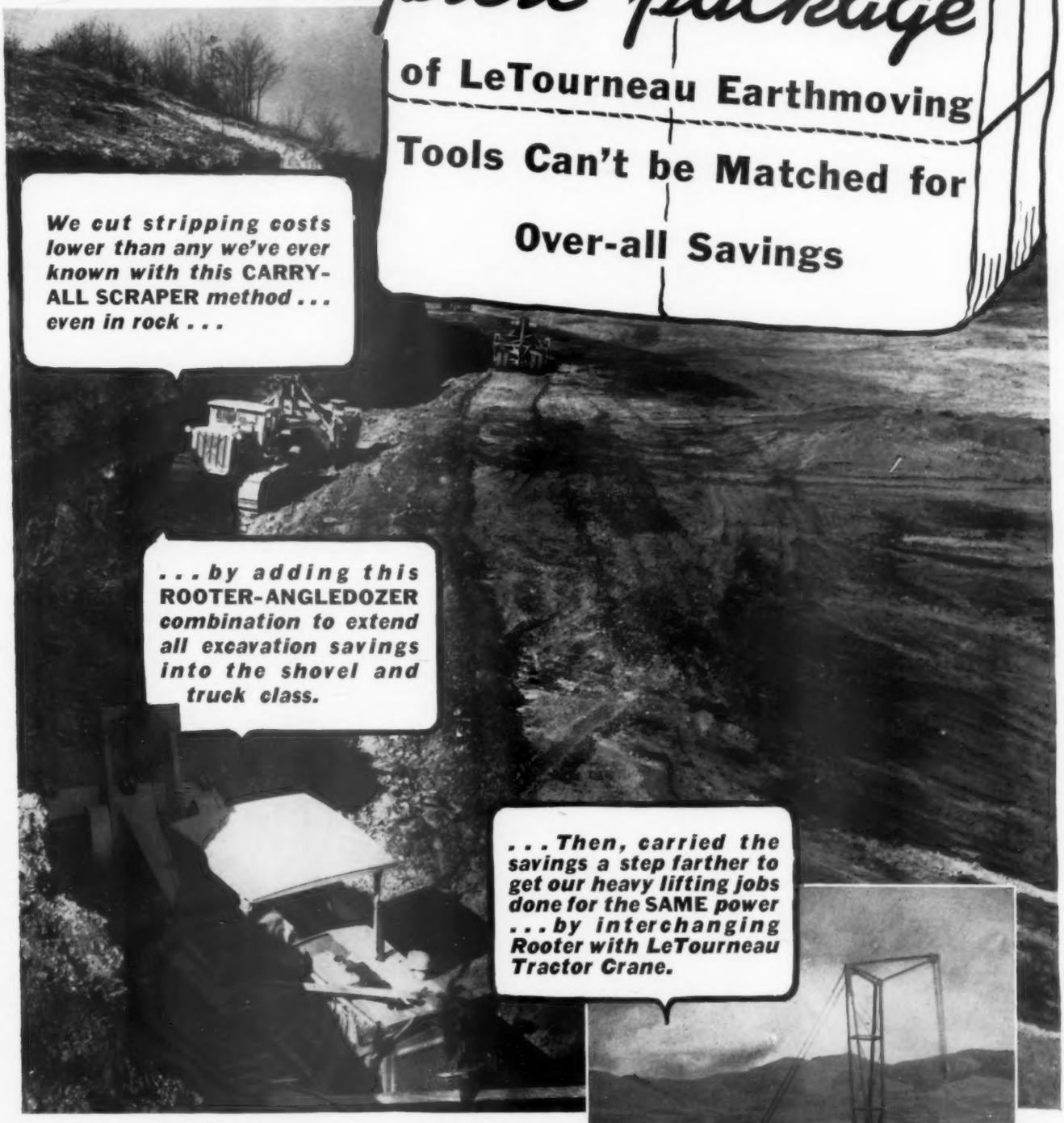
The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR
WIRE COMPANY
SAINT LOUIS

The complete package

of LeTourneau Earthmoving Tools Can't be Matched for Over-all Savings


We cut stripping costs lower than any we've ever known with this CARRY-ALL SCRAPER method . . . even in rock . . .
. . . by adding this ROOTER-ANGLEDOZER combination to extend all excavation savings into the shovel and truck class.
. . . Then, carried the savings a step farther to get our heavy lifting jobs done for the SAME power . . . by interchanging Rooter with LeTourneau Tractor Crane.

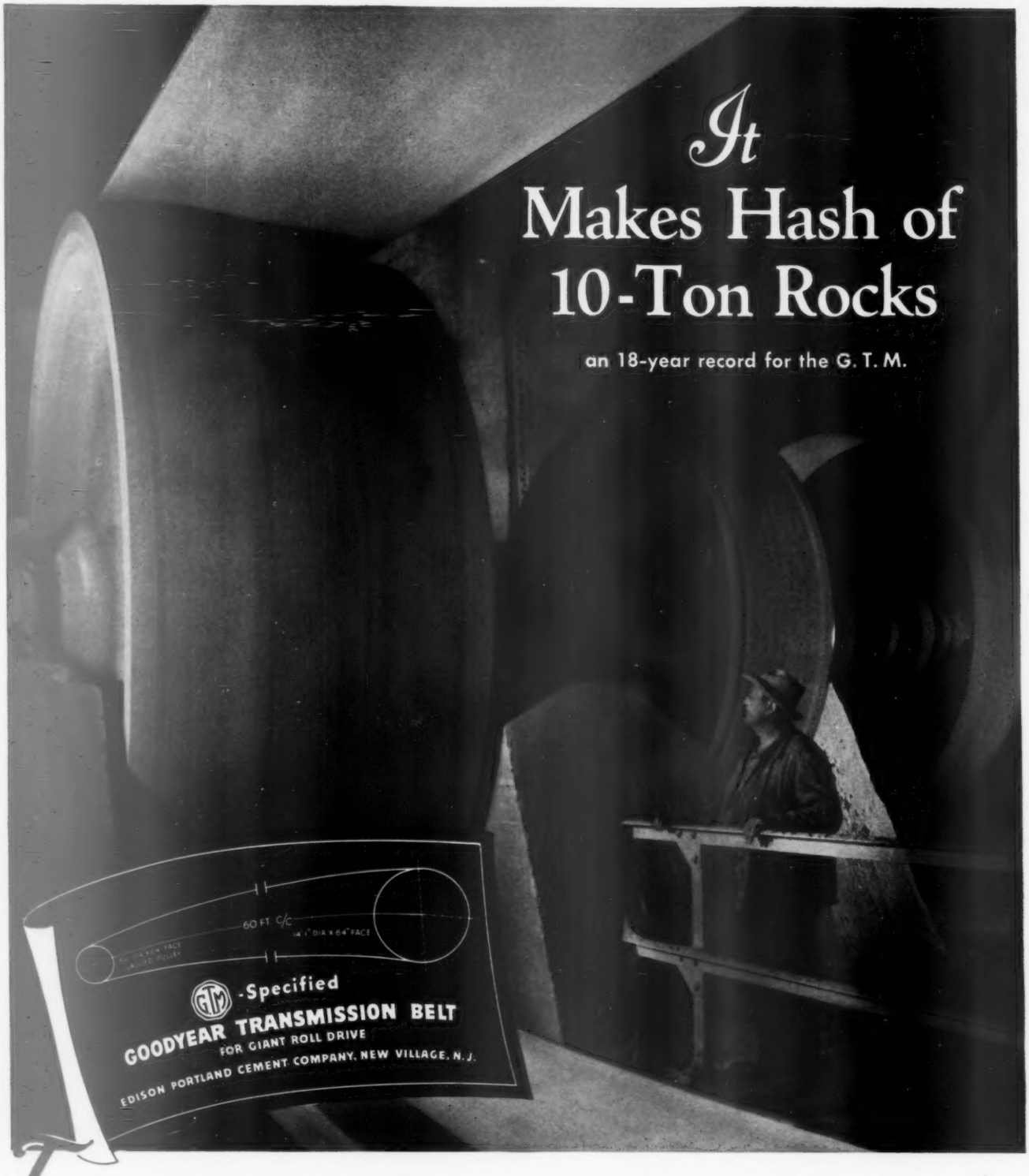
. . . Yet, it took performance—by actual job demonstration—to convince these confirmed LeTourneau users. Your LeTourneau and "Caterpillar" dealer is ready to make you the same offer . . . or write R. G. LeTOURNEAU, INC., Peoria, Ill., Stockton, Calif.

LETOURNEAU

Stripping **EQUIPMENT**

Carryall* Scrapers, Angledozers,* Bulldozers, Rooters,* Power Control Units, Drag Scrapers, Pushdozers, Cranes, Treedozers. * Name Reg. U. S. Pat. Off.

PIT AND QUARRY, March, 1940, Vol. 32, No. 9. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 20 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the act of March 3, 1897.



To make cement, huge limestone boulders weighing up to ten tons are ground to smithereens at the Edison Portland Cement Corporation plant at New Village, New Jersey. The impact is terrific — the strain upon the belt that drives the giant crusher tremendous! To get a belt that could take it the plant called in the G. T. M. — Goodyear Technical Man — just 18 years ago. The belt he specified, a Goodyear 9-ply rubber transmission belt is still pulling this crushing load. Four years' service was once thought remarkable on this belt-killer, but the Goodyear belt has already beat that more than four times over! That is why it pays to consult the G. T. M. — he saves you time and expense by the correct application of rubber to your toughest problems. To bring him to your plant, write Goodyear, Akron, Ohio, or Los Angeles, California — or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

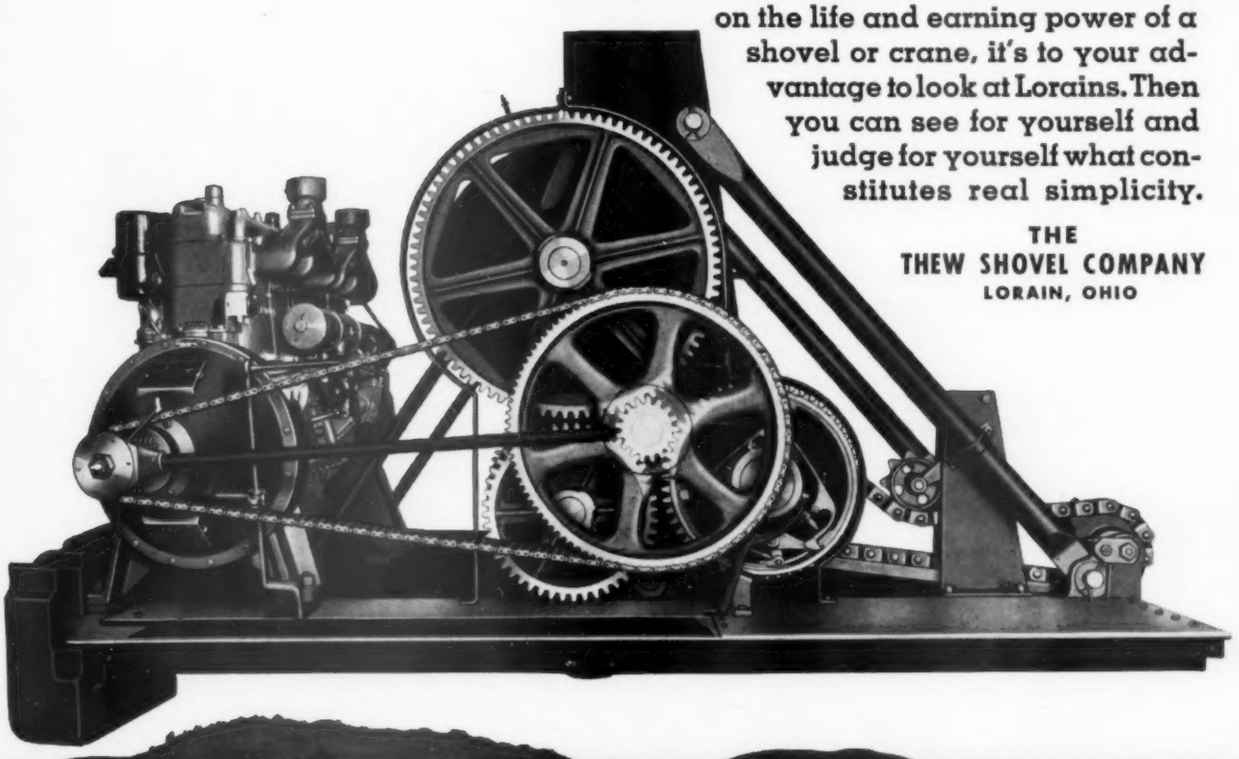
THE GREATEST NAME IN RUBBER
GOODYEAR

YOU CAN SEE IT'S SIMPLICITY

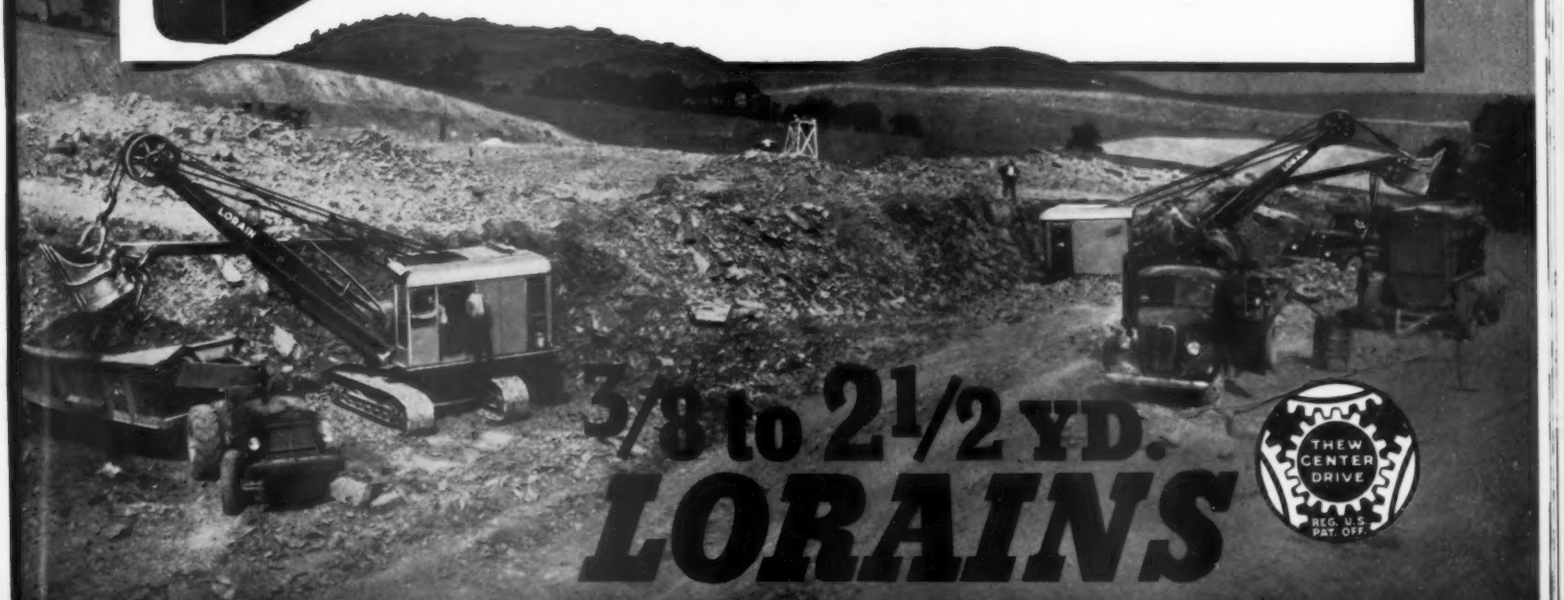
YOU don't have to accept Lorain simplicity on anyone's say so. Just look at this turntable. Note the use of fewer and strong parts—trace the direct flow of power—check the accessibility of the entire assembly. Then compare it point-for-point with *any* shovel or crane turntable on the market today. Your eyes will give you the answer to the true simplicity of Lorain's basic Center Drive design.

But don't stop there. Step up into the cab of a Lorain. Find out for yourself how "alive" it is—how easily and quickly the clutches respond—how power concentrates just where you want it.

If you feel, as do most contractors, that simplicity of design has an important bearing on the life and earning power of a shovel or crane, it's to your advantage to look at Lorains. Then you can see for yourself and judge for yourself what constitutes real simplicity.



THE
THEW SHOVEL COMPANY
LORAIN, OHIO

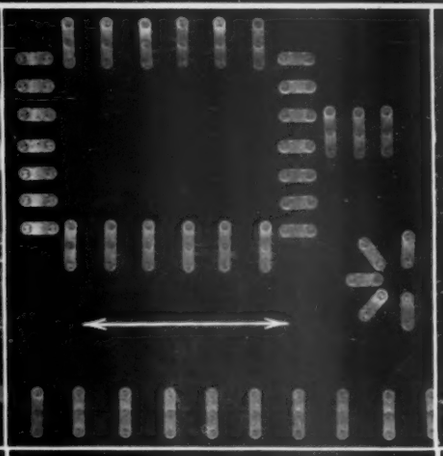


3/8 to 2 1/2 YD.
LORAINS

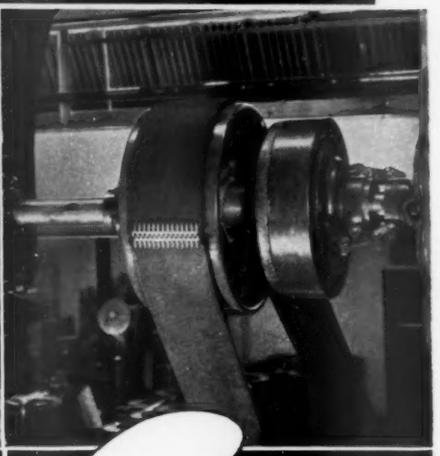
THEW CENTER DRIVE
REG. U.S. PAT. OFF.

Solve your belt fastening problems IN THREE EASY STEPS-

1 By fastening conveyor belts with Flexco HD Belt Fasteners.

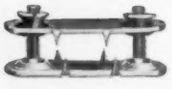


2 By repairing and patching conveyor belts with Flexco HD Rip Plates.



3 By lacing transmission belts with Alligator Steel Belt Lacing.

YOU can avoid shutdowns and lengthen the life of your conveyor belts by using Flexco HD Belt Fasteners and Rip Plates. These Flexco fasteners make a strong, tight butt joint with long life. Recessed plates embed in the belt, compress belt ends and prevent ply separation. Made in five sizes in steel and alloys to cover corrosion resisting, abrasive resistant, and non-magnetic requirements.



Flexco HD Rip Plates are used in repairing rips and patching conveyor belts. Their use saves expensive replacements and extended shutdowns.

Bulletin F-100 shows exactly how to handle conveyor belt fastening and repair work with these Flexco HD Belt Fasteners and Rip Plates. Write for your copy.

mission belts Alligator Steel Belt Lacing is the most universally used belt lacing in the world. It is applied easily and quickly with a hammer —no holes are punched and the teeth do not cut across the belt fibres. Its compression grip protects the belt ends and there is no danger of ply separation. It embeds in the belt and is smooth on both faces. The two piece rocker hinge pin greatly increases the service life and the joint is remarkably flexible. The pin can be easily removed to separate the belt.

Every plant should have a supply of Alligator Steel Belt Lacing on hand. Twelve sizes for flat belts of all types up to 5/8" thick. Special lengths for wide belts. Also made in "Monel" and "Everdur."

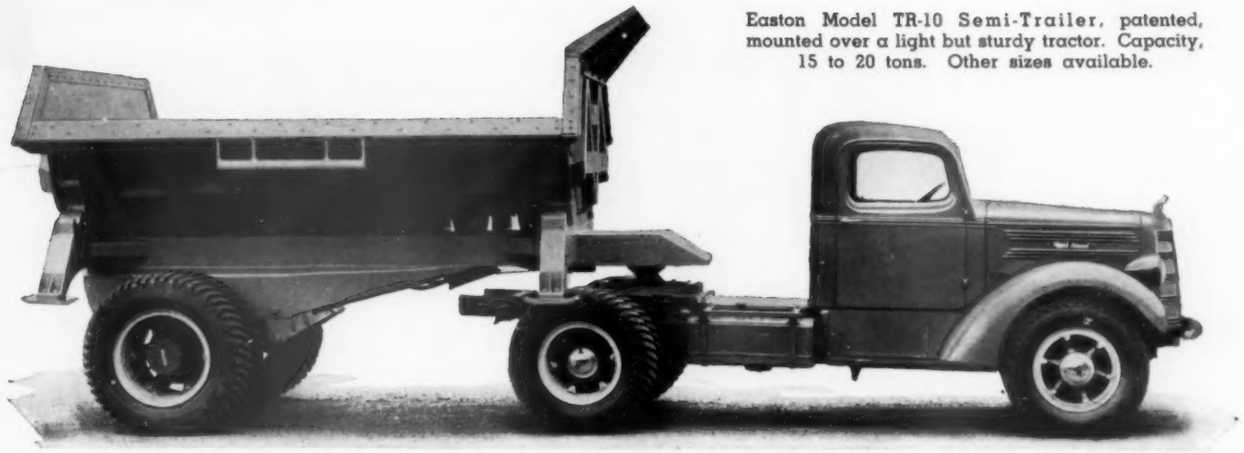
Order Flexco HD Belt Fasteners and Rip Plates and Alligator Steel Belt Lacing from your supply house.

FLEXIBLE STEEL LACING CO., 4623 Lexington Street, Chicago, Illinois

FLEXCO HD BELT FASTENERS
REG. U.S. PAT. OFFICE

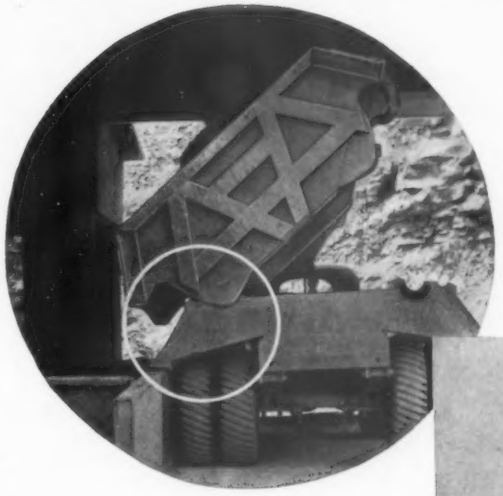
and

ALLIGATOR STEEL BELT LACING
TRADE MARK REG. U.S. PAT. OFFICE



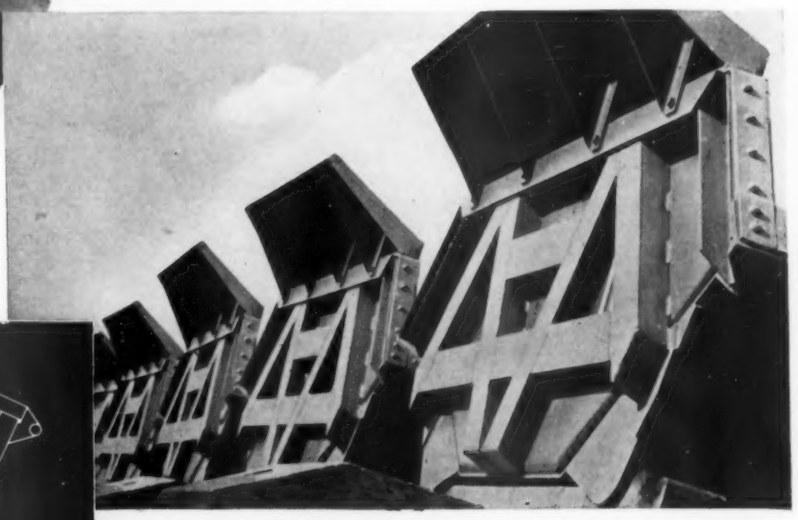
Easton Model TR-10 Semi-Trailer, patented, mounted over a light but sturdy tractor. Capacity, 15 to 20 tons. Other sizes available.

Combining a new smaller tractor with a big semi-trailer to give you faster haulage at a much lower cost per ton



Dumping in ten seconds by fixed hoist (electric or hydraulic). Note how outriggers (in circle) rest on sill when body is tilted for dumping, to relieve truck chassis from strain.

BIGGER PAYLOADS . . . the 1940 password to profits! Haulage costs can be cut (often over 35%) and tonnage boosted by the patented Easton Semi-Trailer, which has made possible the application of relatively light tractors to heavy-duty quarry service. Result: immediate savings in purchase price, and day-to-day economies in fuel and operating costs. When you overhaul your haulage system investigate this modern combination of large-capacity trailer and economically-powered tractor.



● A dramatic photo of part of a fleet of 29 Phoenix Semi-Trailers in use by one well-known operator.

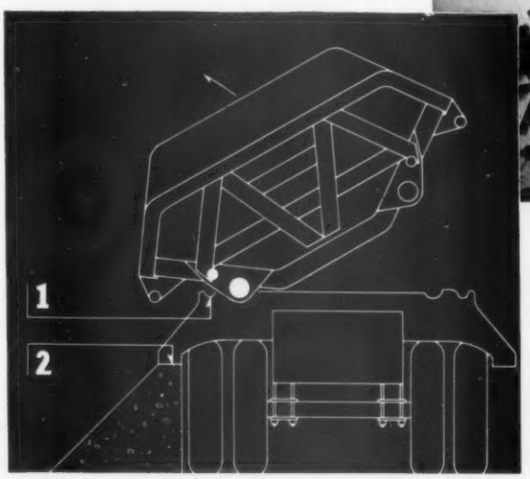


Diagram at left shows the operation of the Easton double-hinge and outrigger. (1) The auxiliary hinge takes the load at the point where it would place the greatest strain on the light tractor chassis, and transfers this strain to (2) the sturdy outriggers which rest on the concrete sill.

Write for information. Ask to see our Natural Color Movies.

EASTON CAR & CONSTRUCTION COMPANY, EASTON, PA.

ALL TYPES OF CARS, TRUCK BODIES AND TRAILERS FOR ROCK HANDLING

ROAD BUILDERS vote a *Straight* Cedarapids Ticket

ROAD BUILDERS OFFICIA

CO
EQ

Cedarapids EQUIPMENT

HAMM

CRUS

STAT
ASPI
PLA

KUBIT IMPACT BREAKER

MOTOR-ELECTRIC POWERED PORTABLE CRUSHING PLANT

PORTABLE TWO-UNIT TOWER TYPE ASPHALT MIXING PLANT

The "Kubit" Impact Breaker, shown for the first time, attracted practical Road Builders by its new principle of Impact rock and gravel breaking. This equipment produces aggregate in the shape of a cube from any material and in any size specified. This is the machine you need to meet the trend for a new specification material for road and concrete mixtures.

● ***It was a landslide election for "Cedarapids" equipment at the 1940 Road Show. An overwhelming majority voted the "Cedarapids" plants the most modern and advanced in Engineering Design . . Compactness . . Portability . . Ease of Operation . . Quick Set-Up and Low Cost Operation.***

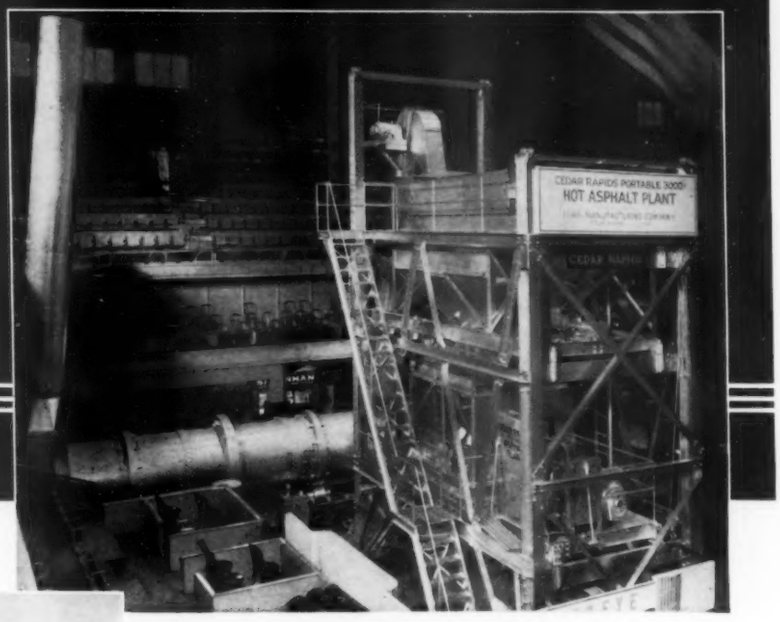
Cedarapids

PORTABLE and STATIONARY

CRUSHING PLANTS ASPHALT MIXING PLANTS

WASHING PLANTS MATERIAL HANDLING EQUIPMENT

Dominating the arena, the 3000 lb. Portable Two Unit Tower Type Asphalt Mixing Plant attracted thousands of contractors, engineers and highway commissioners. Their unanimous approval marks another step toward Better Roads at Lower Cost with "Cedarapids" equipment.



. BALLOT
MPETITIVE
UIPMENT

The newly designed motor-generator driven Portable Super Tandem Crushing Plant stopped the crowd. Built in three portable units to meet limits of weight and size for highway transportation, this machine is the most modern, compact and efficient electric powered portable crushing plant in the industry. Push button start and stop - one man control speeds up production, lowers cost.

WRITE FOR COMPLETE DETAILS OF "CEDARAPIDS" PLANTS — THE MOST COMPLETE LINE OF ROCK AND GRAVEL CRUSHING AND ASPHALT MIXING EQUIPMENT IN THE INDUSTRY

IOWA MANUFACTURING COMPANY

CEDAR RAPIDS, IOWA, U. S. A.

LOUISVILLE BUILDS SEVEN DIFFERENT TYPES OF DRYERS!

As the nation's greatest specialists in rotary drying, we know it's utterly impossible for any *one* type of dryer to do an efficient job in *all* "pit and quarry" applications. . . . We have *proven* that in addition to the one type most often used in these industries, *three other* of our seven types have definite superiorities for various applications in your field. . . . We would welcome an opportunity to give you the facts. *Address:* Louisville Drying Machinery Co., *Incorporated*, 435 Baxter Ave., Louisville, Kentucky.

PIPE WORRIES END with NAYLOR

It's simple arithmetic. If a light-weight pipe can do the job, why pay a premium for heavy pipe?

Naylor is taking this high cost out of jobs everywhere and giving a premium in performance besides.

The exclusive Lockseam Spiralweld gives you pipe that is light in weight yet so leak-tight, flexible, strong and safe that it is a natural for high or low pressure lines. No other light-weight pipe offers you all these advantages. Sizes from 4" to 30" in diameter meet every requirement. All types of fittings and connections. Complete fabrication service. Write for Catalog No. 37 and learn how Naylor can end your pipe worries and save you money.

NAYLOR PIPE COMPANY
1257 EAST NINETY-SECOND STREET
CHICAGO, ILLINOIS

NAYLOR LOCKSEAM SPIRALWELD **PIPE**

YOU ARE IN *Good Company* WHEN YOU BUY

This is a representative list of the constantly growing number of outstanding firms using Buell equipment for dust collection or fly ash correction. Star (*) indicates *re-orders* as a result of the satisfactory operation of initial Buell installations.

***FORD MOTOR COMPANY**
5 separate installations at Dearborn, Mich.

***LONE STAR CEMENT CORPORATION**
Norfolk, Va., and Spocari, Ala.

DOW CHEMICAL COMPANY
Midland, Mich.

***WISCONSIN ELECTRIC POWER COMPANY**
2 separate installations at Milwaukee, Wis.

***LEHIGH PORTLAND CEMENT COMPANY**
Union Bridge, Md., Sandts Eddy, Pa., Fordwick, Va., Oglesby, Ill.

INTERNATIONAL PAPER COMPANY
New York, N. Y.

THE DETROIT EDISON COMPANY
Detroit, Mich.

***MEDUSA PORTLAND CEMENT COMPANY**
Wampum, Pa., and York, Pa.

***AMERICAN POTASH & CHEMICAL COMPANY**
4 separate installations at Trona, Calif.

KOSMOS PORTLAND CEMENT COMPANY
Kosmosdale, Ky.

CONGOLEUM-NAIRN, INC.
Kearny, N. J.

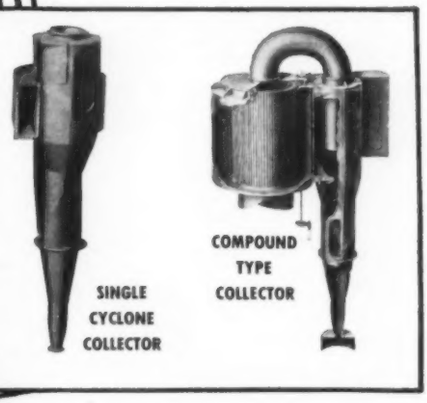
REGAL LAUNDRY, INC.
Baltimore, Md.

buell
DUST COLLECTORS

● More than 1200 companies throughout the world are now using the patented Van Tongeren System used exclusively in Buell Equipment. The Van Tongeren cyclone, *with its dust pocket*, offers these important advantages:

HIGH EFFICIENCY
LOW FIRST COST
NEGLIGIBLE MAINTENANCE
LONG, TROUBLE-FREE LIFE

Submit your dust collection or fly ash correction problems to the Buell Testing Laboratory for sound, impartial advice. Write today for "DUST COLLECTION" and "FLY ASH CONTROL"—two informative booklets, either or both of which will be sent on request, without obligation.



SUITE 5000, 12 CEDAR STREET, NEW YORK

BUELL ENGINEERING COMPANY, INC.

Wherever located, you will be quickly served through sales offices of either BUELL ENGINEERING CO., or B. F. STURTEVANT CO.

LIMA
SHOVELS
¾ Yd. to 3 Yds.
Capacity

•

CRANES
12 Tons to 60 Tons
Capacity

•

DRAGLINES
Variable Capacity

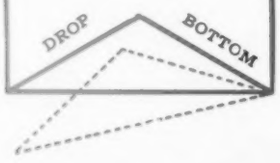
Make your next Shovel, Dragline, Crane or Pull-shovel a LIMA, the excavator that has been proved dependable and economical by successful contractors everywhere.

LIMA LOCOMOTIVE WORKS, Incorporated
SHOVEL and CRANE DIVISION . . . LIMA, OHIO

Newark, N. J. New York, N. Y. Dallas, Texas Portland, Ore. Memphis, Tenn. Los Angeles, Calif. San Francisco, Calif. Seattle, Wash. Philadelphia, Pa. Spokane, Wash. Montreal, Quebec, Can. Vancouver, B. C.

DEMPSTER DUMPSTER

DETACHABLE BUCKETS



- No High Pressure Hose
- No Counterweight
- No Auxiliary Jacks

LF-2 . . . ONE OF THE NEW MODELS

DEMPSTER-DUMPSTER Pays Its Own Way . . . Is Self-Liquidating . . . Turns Losses Into Profits. Get the Facts NOW! There's a Dealer Near You.

DEMPSTER-DUMPSTER is the spearhead of attack against operating wastes. One unit can serve four to ten buckets . . . does the work of four or five trucks. No wasted man-hours, no idle labor. The DEMPSTER-DUMPSTER is never idle on the job, constantly on "the go," no lost motion, no waiting for it to be loaded and returned. Buckets handle up to 6 yards, depending upon the material. Costly breakdowns are unknown with DEMPSTER-DUMPSTER on the job. Simply constructed of rugged materials, DEMPSTER-DUMPSTERS have been in service for more than 6 years without a major breakdown. Write for complete details. Just ask for Bulletin No. 501.

Exclusive sales territory available for responsible dealers. Write for details.

DEMPSTER BROTHERS, Inc. KNOXVILLE, TENNESSEE

PRINT IN BINDING

READY FOR *Spring* CONSTRUCTION ACTIVITIES?

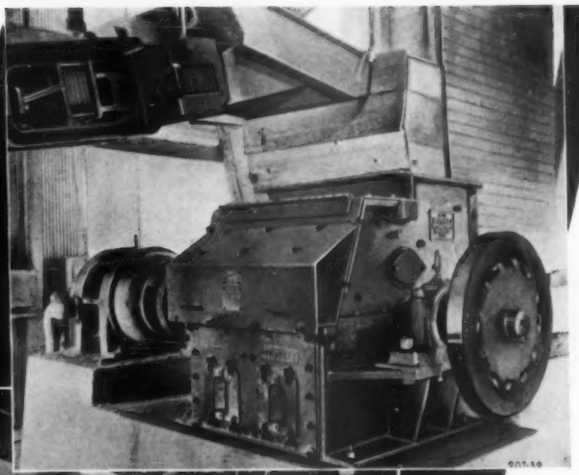
JEFFREY FACILITIES ARE AT YOUR SERVICE

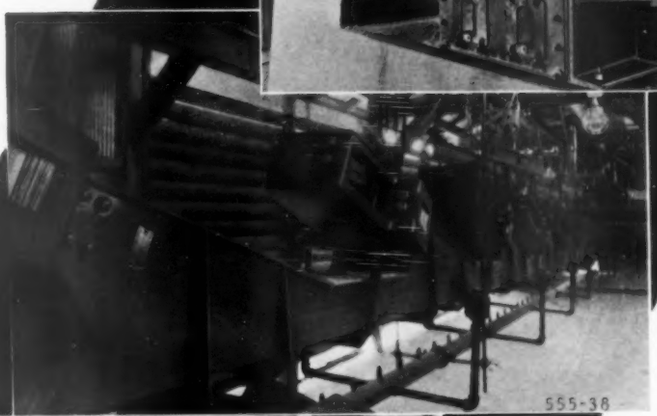
REPLACEMENT PARTS OR COMPLETE UNITS

Jeffrey equipment and plant engineering cover the entire stone products industry...sand and gravel, crushed stone and cement. In this broad line are . . . apron, belt and screw conveyors; bucket elevators, feeders and screens; sand dewaterers, portable conveyors and loaders; crushers and pulverizers; products, such as chains, spockets and belt idlers for replacement purposes.

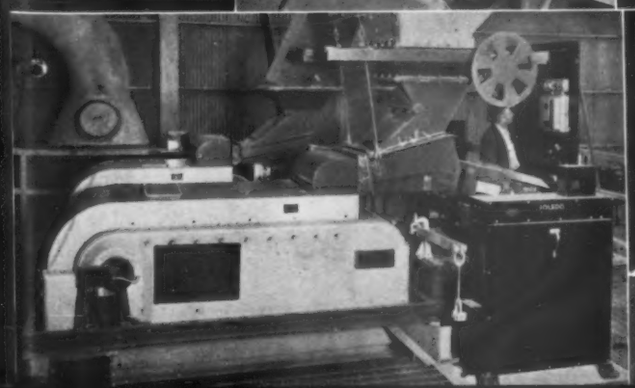
Since 1877, Jeffrey has established a reputation for fair dealing and the ability to provide a practical and economical method to handle or reduce your material. The experience we have gained during these years of serving we will be glad to pass on to you.

When you are thinking of equipment which will give long service and maximum economy ...think of Jeffrey and BE SURE.





ow: Jeffrey-Traylor pe 300 and 350 ytrols accurately portioning two dif- ent materials. They remotely con- lled by operator. d for details on ffrey Waytrol ders.



It is impossible to show everything Jeffrey makes for your industry but we have selected a few typical installation views to give you a fair idea of our facilities and broad line of improved products.

Beginning at the top: A Jeffrey-Traylor electric vibrating feeder delivering material at controlled rate to a Jeffrey swing hammer pulverizer—an ideal combination. Next is shown a Jeffrey-Traylor electric vibrating cooler taking discharge from kiln at 1200 F. and delivering material at 150 F. Jeffrey-Traylor electric vibrating screens and a Jeffrey steel apron conveyor are shown in the two small views at the left.

For the sake of economy and efficiency . . . for maximum freedom from costly and annoying maintenance problems in processing and handling . . . call on Jeffrey engineers. They rely on experience.

THE JEFFREY MANUFACTURING COMPANY

917-99 North Fourth Street, Columbus, Ohio

BINDING

IN THE KENTUCKY STONE COMPANY PLANT . . . . . .

TELSMITH GYRASPHERE

produces 120 tons per hour of minus 1½" stone!

●Wide experience . . . gained in operating ten quarries in Kentucky . . . has made the Kentucky Stone Company of Louisville very critical of quarry plant equipment.

For their Tyrone Plant* they selected this No. 48 Telsmith Gyrasphere because they wanted to get finer crushing, a wider range of sizes as well as greater tonnage. Are they getting it? *They are.*

120 tons an hour of 1½" and down!

And the Gyrasphere would do better still, if the primary breaker, and the two vertical skips that hoist the rock from where it is mined underground, could dish it up any faster. With its unregulated choke feed this Gyrasphere sure can take it—and handle it—with less trouble, less power and less up-keep.

And why not—it's a rugged, high-speed, super secondary crusher—with every modern feature of design. Spherical head! Double wedge crushing action! Roller thrust bearings! Spring relief! Effective sealing and lubrication! Furnished with interchangeable coarse or fine crushing concaves, you can get the sizes you want—1½" to ⅜", or ⅜" to ⅛". And you'll get better, more cubical aggregate, too. *Bulletin Y-15* tells you why and how. *Get one.*

** Plants at Irvington and at Russellville have also been modernized with Telsmith crushing and screening equipment.*

Y-2-40

TELSMITH

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Senaworks, Milwaukee—Concrete, London

50 Church St., New York City
311 W. Wacker Drive, Chicago, Ill.
713 Commercial Trust Bldg., Philadelphia, Pa.
81 Binney St., Cambridge, Mass.
412 Westinghouse Bldg., Pittsburgh, Pa.
Brandeis M. & S. Co., Louisville, Ky.
Canadian Vickers, Limited, Montreal
Gordon Russell, Ltd., Vancouver

Fortified Against Punishment

Republic Conveyor Belting

● Conveyor belting can't kick back at the pounding it takes in handling heavy, abrasive lump materials. But if you're looking for a belt that's built for defense . . . built to take the severest kind of wear and tear without weakening—that's Republic Conveyor Belting. Its thick, tough cover is made of a special abrasion-resisting rubber compound that indefinitely withstands the impact and cutting action of the material. The construction details of the carcass are designed to harmlessly absorb all stress and mechanical forces of destruction. Every Republic Conveyor and Elevator Belt is Provar Processed—permanently treated against mildew. For a belt that's built to keep going on your job, specify Republic. REPUBLIC RUBBER DIVISION OF LEE RUBBER AND TIRE CORPORATION, YOUNGSTOWN, OHIO.

HOSE • BELTING
PACKING • MOLDED PRODUCTS

REPUBLIC RUBBER

ORDER REPUBLIC RUBBER PRODUCTS FROM YOUR DISTRIBUTOR

If Your Grinding Problem is "different" . . . the IMP MILL is Your answer

Typical Products handled by Raymond Imp Mills

Tetra Sodium Pyro Phosphate
Low Gravity Red Lead and Litharge
Pulverizing and Firing Pitch
Drying and Grinding Clay
Asphaltic Limestone
Phosphate Materials
Potassium Chlorate
Grinding Mica
Burnt Lime
Chemicals
Resins
Coal

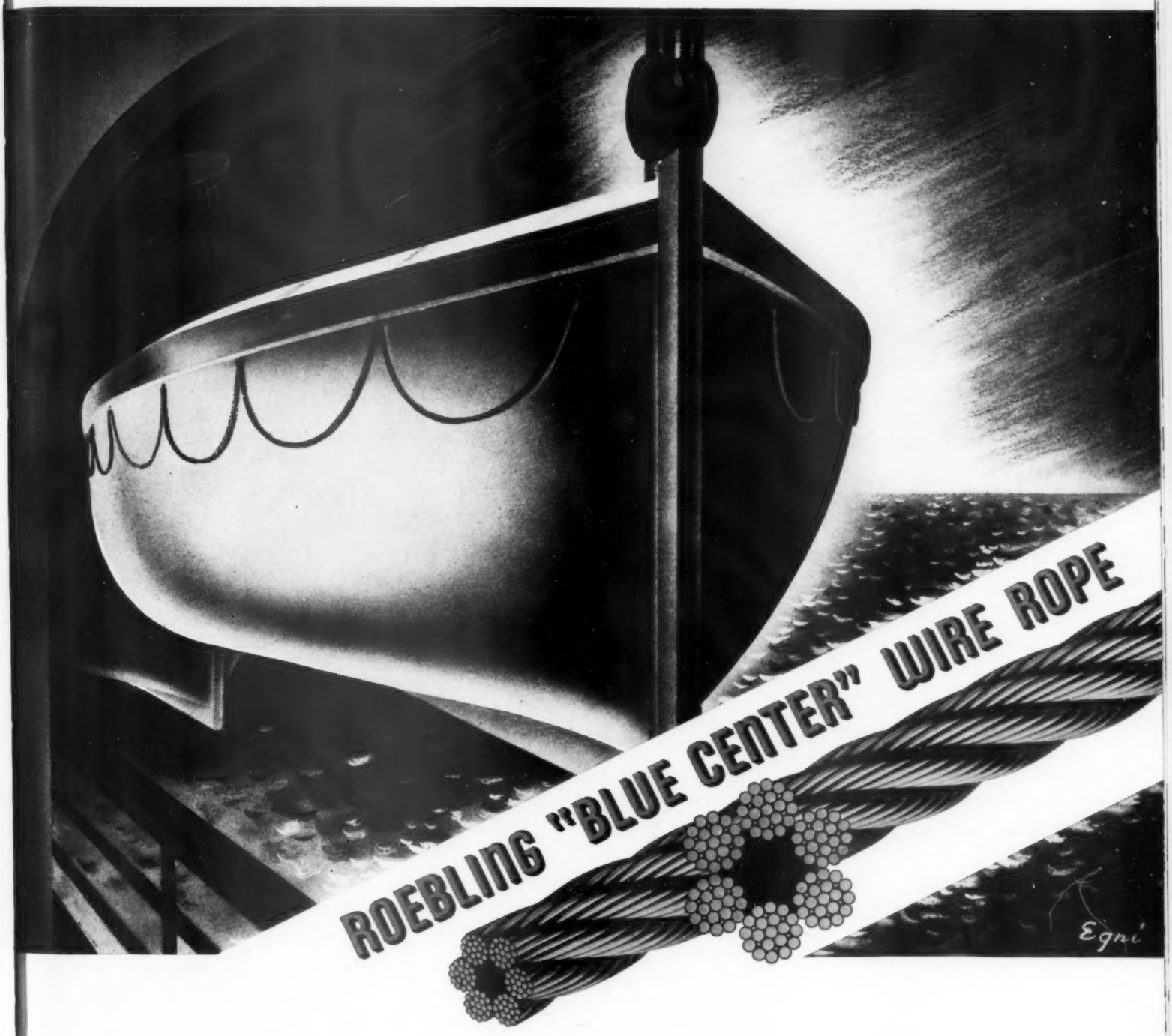
There is a place in every industry where the Imp Mill can be used to reduce the production cost of powdered materials: By simplifying complicated operations . . . shortening time of process . . . or combining the drying and grinding in a single unit of equipment.

This utility mill may be equipped with air separation . . . with a whizzer separator . . . or operated in closed circuit with a Raymond Mechanical Air Separator for obtaining any degree of classification from granular products up to micron material. It may be used with Raymond flash drying for removing moisture and delivering the product in dry, powdered form.

Ask for the new Imp Mill Bulletin No. 41

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1321 North Branch Street **CHICAGO**
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

FOR EXTRA SAFETY



A wire rope developed to provide the ultimate in safe, saving service. The finest product of Roebling's unexcelled steel-making, research and rope-fabricating facilities!

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.
BRANCHES IN PRINCIPAL CITIES

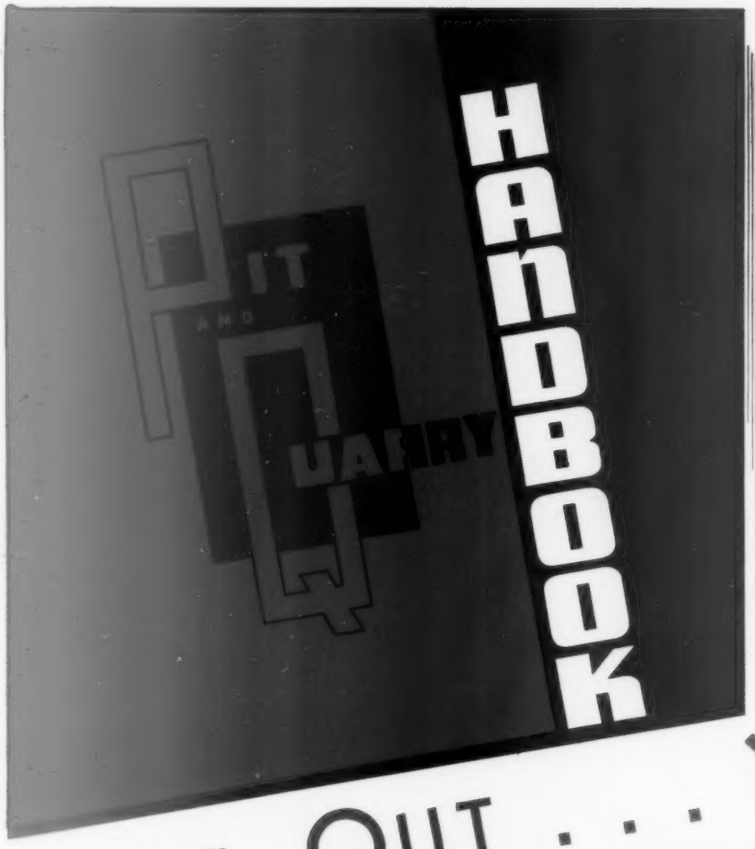
STRONGER—Wire of highest strength consistent with ductility and toughness

TOUGHER—Provides maximum resistance against wear, sudden shocks, vibration

SAFER—Unequalled for uniformity of quality

SAVING—Insures lowest general average operating cost

THE HIGHEST DEVELOPMENT IN ROEBLING WIRE ROPE



- **Complete, accurate and up-to-the-minute Directory.**
- **Hundreds of new names; others checked and revised.**
- **Alphabetical by companies; geographical by plants.**
- **Consolidated catalogs of equipment makers.**
- **Revised and improved technical section.**

JUST OUT . . . YOUR 1940 MAILING LIST...ORDER IT NOW!

Don't Waste Your Time and Postage on an Old List

The compilers of the 1940 Directory Section of Pit and Quarry Handbook have labored painstakingly to build an accurate list of all known American producers of nonmetallic minerals. Each new listing has been carefully scrutinized for accuracy and completeness. Previous listings have been revised, checked, double-checked. All appear two ways—(1) alphabetical by companies, (2) geographical by plants. It gives you company names, officers, location of plants, size or capacity, and names of the men who do the buying. Select the complete Handbook *and* Directory, or the convenient, flexibly-bound Directory alone. Now ready for distribution. Order NOW to insure getting one of the first copies. Use coupon below . . . we'll bill you after you get the book.

Pit and Quarry, Date.....

538 S. Clark St., Chicago, Ill.

Please send.....copies of the 1940 HANDBOOK ($10.00 per copy)

Please send.....copies of the 1940 DIRECTORY ($10.00 per copy)

☐ Check enclosed.....

☐ Send Invoice with book

Name ..... Title.....

Company .....

Town ..... State.....

A MARION
STRIPS TOP SOIL FROM SILICA BED for Standard Silica Corp.

For the purpose of uncovering its silica sand deposits, The Standard Silica Corporation, Ottowa, Illinois, employs a MARION Type 331—3/4 cu. yd. shovel. When it catches up with this job, it is moved here and there over the Standard properties for numerous digging jobs. Exceptional speed, mobility, stamina and low cost operation are accountable for the popularity of this 3/4 cu. yd. MARION. Write for bulletin describing this machine in detail or for other sizes from 1 cu. yd. up. » »

THE MARION STEAM SHOVEL CO.
Marion, Ohio, U. S. A.

MODERNIZE with

MARION

SHOVELS • CLAMSHELLS • DRAGLINES • CRANES • WALKERS

Stumped by a stack of Rope data . . .

ask your Bethlehem distributor

One of the most important steps in getting maximum life from wire rope is selecting the proper size, grade and construction of rope. With the thousands of different ropes that are made, with the hundreds of different machines using rope, this is not always a simple job.

When you replace your next rope, why not make sure that the new rope is matched to your equipment. A convenient, practical way to do this is to check with your Bethlehem Wire Rope distributor. He knows wire rope. He has mill recommendations for practically every type, make and model of excavating machinery. If some unusual problem is involved, he has only to ask, and a mill-trained engineer will arrive at your job.

This engineering service is one of many reasons why it pays to deal with Bethlehem distributors when buying wire rope. A letter to Bethlehem Steel Co., Bethlehem, Pa., will bring you the names of the nearest distributors of Bethlehem Wire Rope.

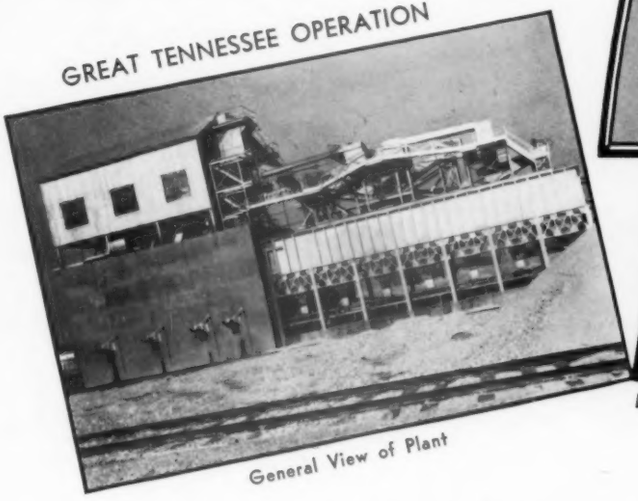
BETHLEHEM STEEL COMPANY

MEMPHIS ADOPTS 7 EAGLES!

SAND AND GRAVEL PLANT

Exclusively

GREAT TENNESSEE OPERATION



General View of Plant

EAGLE-EQUIPPED THROUGHOUT

Employs 6 EAGLE Washers and EAGLE "Swintek" Ladder

This is the brand new ultra-modern sand and gravel plant, erected in Memphis, Tenn., by the Missouri Portland Cement Co., of St. Louis, Mo.

Built of steel and concrete, this outstanding 1940 installation is designed from top to bottom to meet all current and future market demands for high quality, high capacity production.

In keeping with the company's policy of "building with the best," six EAGLE Spiral Screw Washers are used for all sand dewatering operations, right through to the coarse, medium and fine grading of the product.

A 65-foot EAGLE "Swintek" Screen Nozzle Ladder is installed for the dredge, thereby assuring maximum capacity in *continuous*, low-cost sand and gravel pumping.

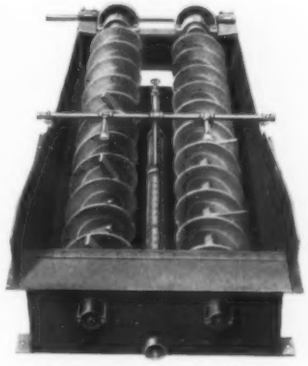
HERE ARE THE EAGLES

EAGLE "Swintek" Screen Nozzle Ladder

Patented nozzle head makes this EAGLE unit the most profitable equipment for all dredge operators. Works deposits inaccessible to plain suction. Gives even, constant feed. Boosts capacity up to 400% —greatly reduces time, labor and power losses.

EAGLE WASHERS

"Good concrete requires clean aggregate"—and EAGLE Washers insure universal approval for your product. These machines are engineered and constructed to give complete satisfaction for record capacity, endurance and economy. Available in Spiral Screw and Paddle Log types, single or double screw, in several sizes and capacities.



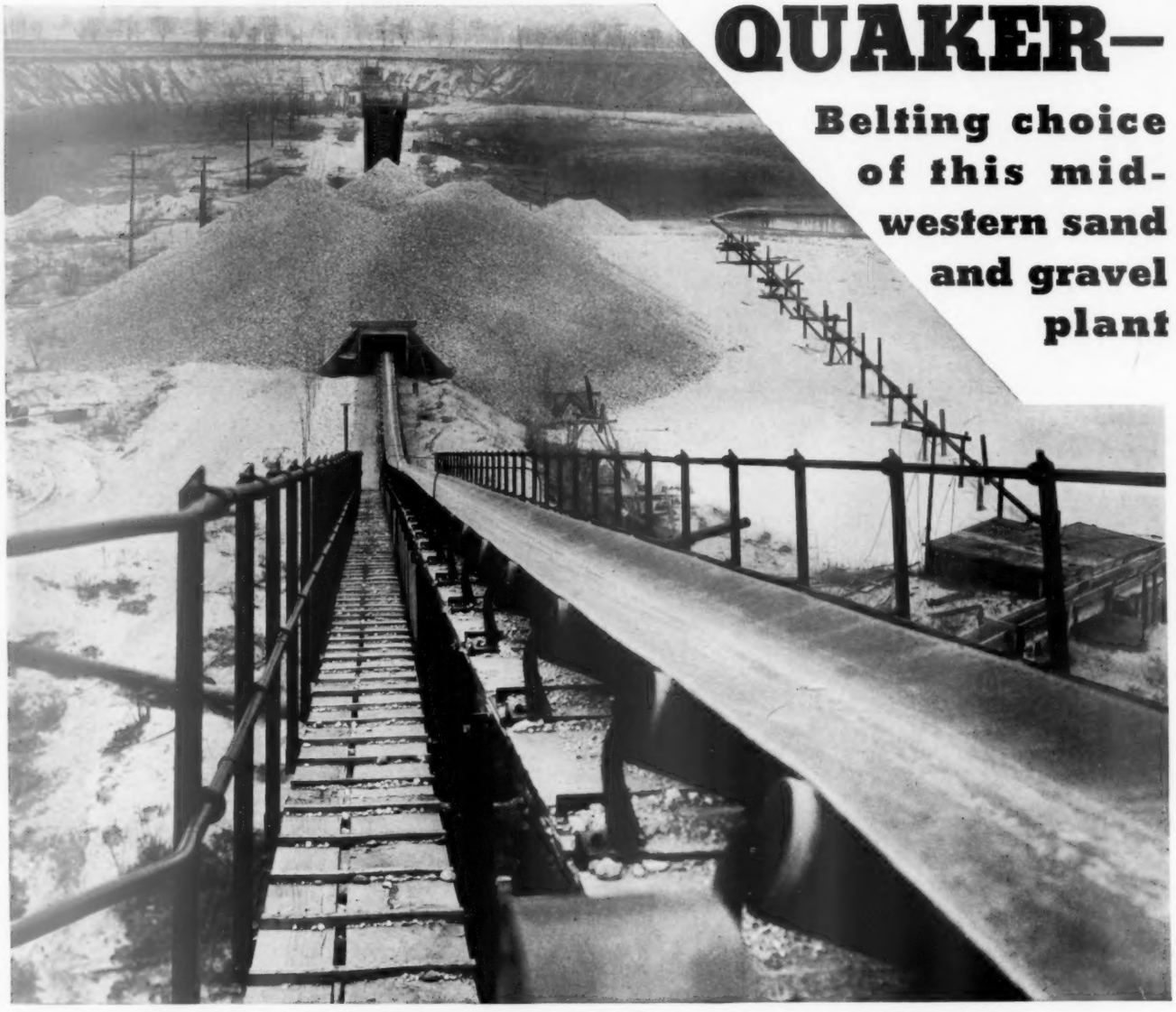
EAGLE Double Screw Washer

Write for Bulletin

EAGLE Products Include:

EAGLE Double Roll Crusher
EAGLE Shale Planer
EAGLE Grinder
Olsen Self-Dumping Cages
EAGLE Dry and Wet Pans
Specialized Mining Equipment

EAGLE IRON WORKS
DES MOINES - IOWA



QUAKER—

Belting choice of this mid-western sand and gravel plant

QUAKER CONVEYOR BELT

Just one unit of a large conveyor installation is shown above. But many Quaker Conveyor Belts are used by this large mid-western sand and gravel plant. Most of these belts are 24" and 30".

Located in all parts of the United States are similar plants where Quaker Conveyor Belts are moving thousands of tons of sand and gravel.

Quaker belts give service...economy. That is why so many concerns insist on Quaker-made Conveyor Belts.

A Quaker Conveyor Belt is not just an ordinary belt... they are special custom-built...designed and manufactured to especially suit individual operating conditions.

A Quaker Belt stays on the job—no costly shut-downs due to belt failure. Every operation in manufacturing a Quaker Conveyor Belt is by skilled executives. In addition, the duck used is woven to our own specifications; the compounding of the rubber is under the guidance of experts—a long-tooth friction is between plies—hair line accuracy in pressure and temperature control is maintained during vulcanization . . . a QUAKER Belt does have stamina.

Think of Quaker when next in need of a belt. Our experienced engineers and belt experts gladly offer their services on any belt problem. Call on them.

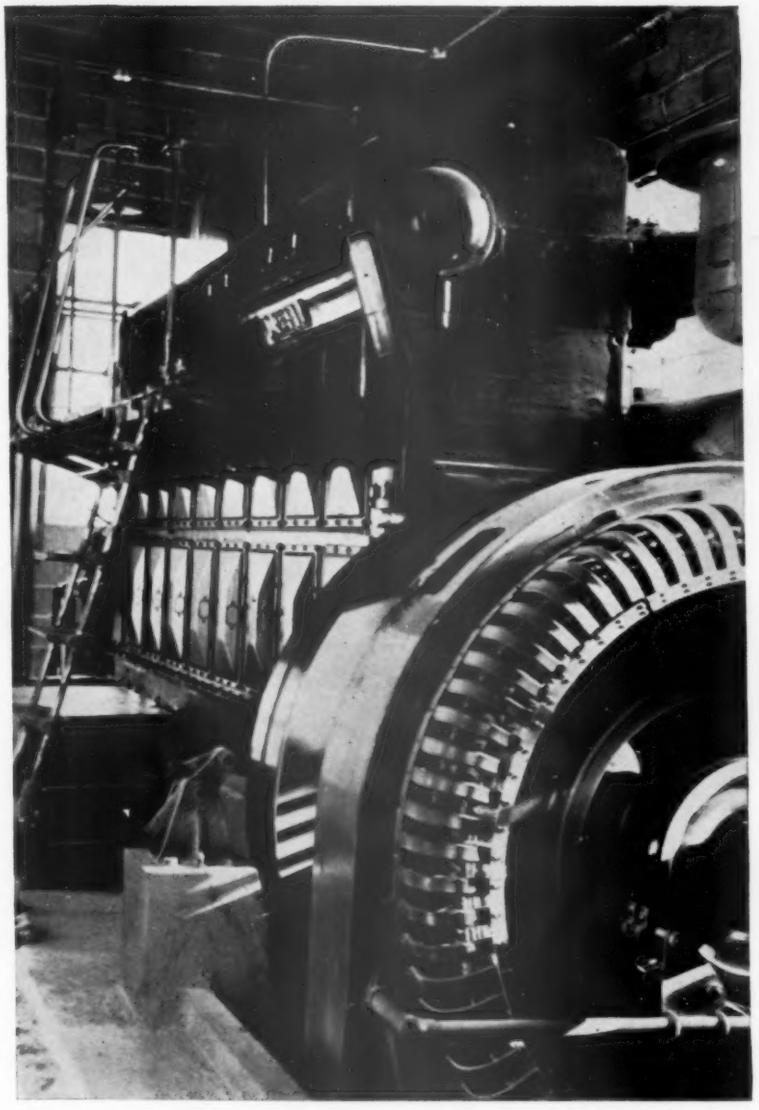
QUAKER RUBBER CORPORATION

OVER 50 YEARS CONSISTENT QUALITY

(formerly QUAKER CITY RUBBER COMPANY)

PHILADELPHIA · NEW YORK · CHICAGO · HOUSTON · SAN FRANCISCO

$6337.44 YEARLY



One 620 H. P. Superior Diesel without standby serves entire load in this plant which is highly fluctuating due to intermittent use of large motors of 150, 75, 50 and 40 H. P. ratings.

.....IS WHAT A NORTHERN OHIO LIMESTONE PLANT OPERATOR ESTIMATES HIS SAVINGS WILL BE WITH A *Superior* DIESEL

A more complete record of operation in this limestone plant of Northern Ohio is yours for the asking.

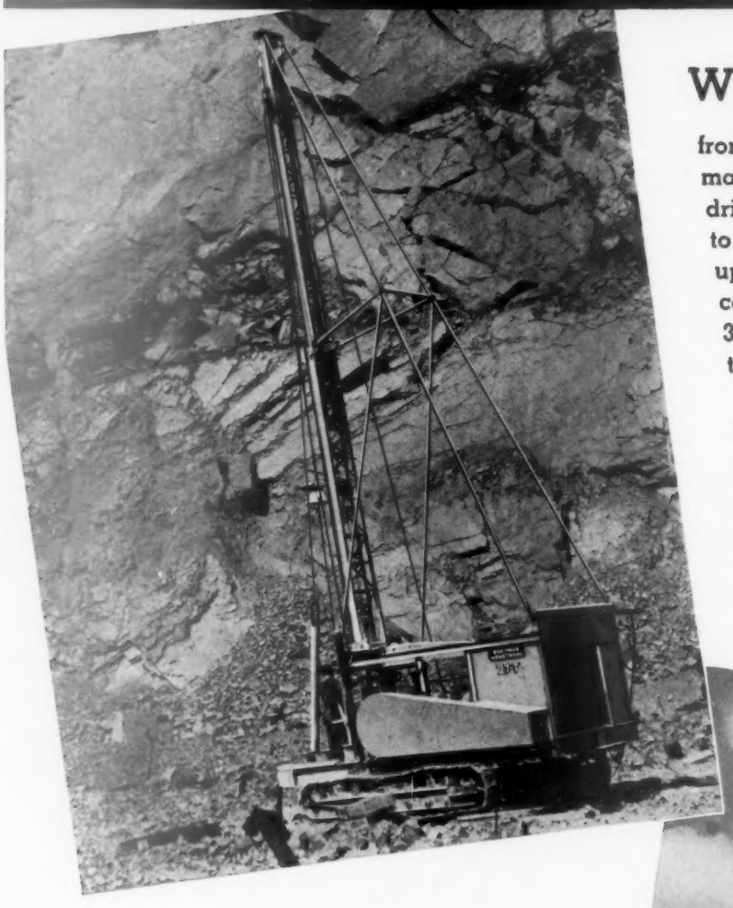
A simple survey of your plant, made without obligation to you, may disclose an equal or greater opportunity for savings in your plant.

Why not request it?

THE NATIONAL SUPPLY COMPANY . . . SUPERIOR ENGINE DIVISION

FACTORIES: Springfield, Ohio; Philadelphia, Pa. · SALES OFFICES: Springfield, Ohio; Philadelphia, Pa.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas

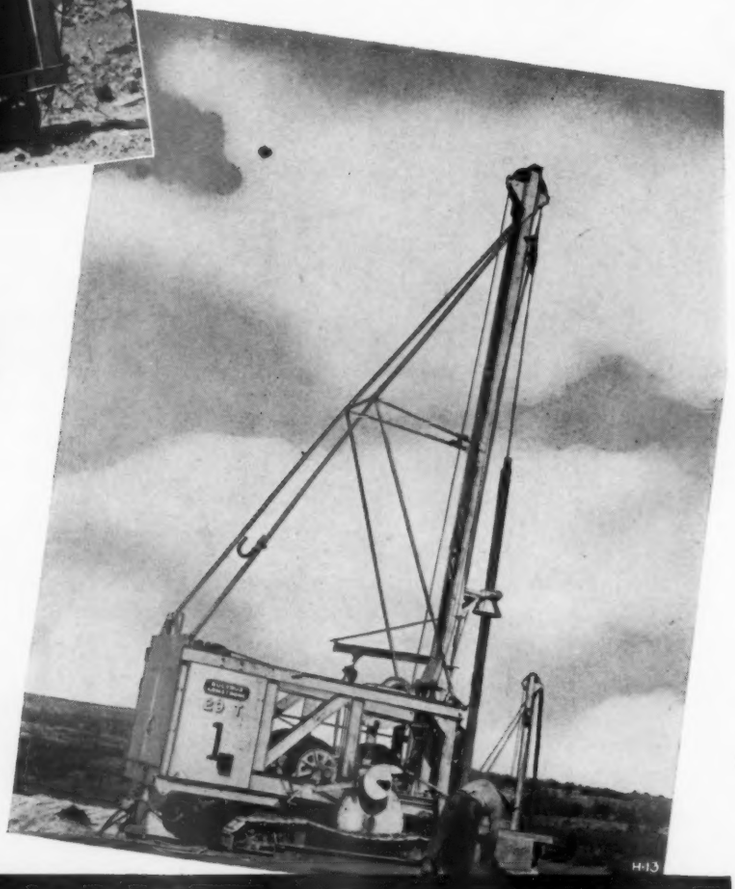
Save money on Your blast hole drilling with BUCYRUS - ERIE DRILLS



WHEN YOU REDUCE YOUR BLAST HOLE drilling costs to a minimum, the profits from your quarry or open pit mine automatically increase. Bucyrus-Erie blast hole drills — the 27-T, 29-T, and 42-T — are built to do this for you. By modernizing, with up-to-date, efficient Bucyrus-Erie drills, you can cut your blast hole drilling costs from 30 to 50 per cent — a saving that turns out to be a MONEY-MAKER.

The 27-T swings 2,000 pounds of tools and drills 6 to 8-inch holes — the 29-T swings 3,000 pounds of tools and drills 9 to 12-inch holes — and the 42-T swings 6,000 pounds of tools and drills 9 to 12-inch holes. These are the fastest drills on the market.

Put Bucyrus-Eries on your job and watch your rock or ore preparation costs drop.



BUCYRUS ERIE

Frequent setups and tool changes take a considerable portion of the blast hole driller's time. But with the new built-in tool wrenches, now available on all Bucyrus-Erie blast hole drills, tool changes are made quickly, easily . . . and safely. Save money by changing costly preparation time into productive drilling time.

Write TODAY for illustrated bulletins on the Bucyrus-Erie line of cost-cutting blast hole drills.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

THIS outstanding plant PIT AND QUARRY describes as "unquestionably one of the show places of the sand and gravel industry. The entire plant and all connected operations show the results of careful planning, and it has the neat and attractive appearance which somehow seems to be inseparable from sound engineering".
The B-G Standardized, Sectional Belt Conveyors contributed to this installation in many ways. B-G Pre-Engineered Truss simplified and speeded up the engineering, gave quicker delivery. B-G Standardized Trusses, and completely assembled, factory aligned drives and terminals greatly simplified erection. The B-G Truss required fewer bents, contributing much to the clean appearance. These, and many more Barber-Greene advantages can serve you as well.
40-3
Via Barber-Greenes
. . . at
Missouri-Portland Cement Company
BARBER GREENE
STANDARDIZED MATERIAL HANDLING MACHINES
AURORA ILLINOIS

ONE OF 7 FOR CHAS. J. ROGERS INC.

DETROIT'S LEADING EXCAVATING CONTRACTOR

PRINCIPAL SPECIFICATIONS
1¼ Yard MODEL 65 20-ton Crane

WEIGHT: 70,000 lbs. as Shovel
POWER: 6-cyl., 114 HP @ 1200 RPM
SHOVEL BOOM: 21′ Chain Crowd
DIPPER STICKS: 16′ Straddle
CRANE BOOM: 45′ standard
CRAWLER WIDTH: 10′-3″
CRAWLER LENGTH: 12′-10″
GROUND PRESSURE: 10.2 lbs.
BASES: Unit Cast Alloy Steel
DRUMS: Tandem, separate shafts
CLUTCHES: Booster operated
GEARS: Helical cut
DIPPER TRIP: Power actuated
BEARINGS: All Machinery Shafts
BOOM HOIST: Wormgear or Independent
SWING SPEED: 4½ RPM
TRAVEL SPEED: ⅝ and 1⅜ MPH
LINE PULL: 17,000 lbs. @ 156 FPM
DRAGLINE PULL: 18,500 lbs. @ 145 FPM

Here is a 1¼ yard convertible shovel with all the operating advantages and design characteristics—plus low first cost—that you want for big, economical output. Since 1935, Chas. J. Rogers, Inc., Detroit, has been a repeat buyer—volume repeat orders like this are the best testimonial we can offer as to dependable and outstanding performance of the BAY CITY. Your first step in experiencing lower operating and maintenance costs is to get a copy of our 32-page illustrated Catalog H-3—write for it—no obligation.

BAY CITY SHOVELS, Bay City, Mich.
Export Office: 330 W. 42nd St., New York City (OPARO)

BAY CITY

SHOVELS · CRANES · DRAGLINES · TRENCH-HOES · SKIMMERS

PIT AND QUARRY

Vol. 32 MARCH, 1940 No. 9

CONTENTS

News of the Industry 27

Editorial: The Engineer and Social Problems 32

Missouri Portland Cement Co. Builds Outstanding Gravel Plant at Memphis . . 33

Iron, Other Silica-Sand Impurities Removed by Concentrating Tables 41

Labor and Legal Problems Interest Crushed-Stone Men at Convention 44

Mining Engineers Ponder Problems of Economic Import at Annual Meeting . . 56

Making Precast Concrete Joists by Continuous Production Methods 75

Nation's Concrete-Products Makers Assemble for Annual Convention 78

This Radio-Transmitter Station Required Blocks of 16 Shapes 83

After 54 Years Block Manufacturer Still Solves Own Problems 84

Adds Equipment to Produce Bricks 87

Problems Facing Concrete-Pipe Industry Discussed as ACPA Holds 33rd Annual Convention 89

Personal Mention 59
Occupational Diseases and the Law . . . 61
Labor Decisions 64
Traffic News Digest 67
New Machinery and Supplies 69

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyrighted 1940 by Complete Service Publishing Co., 538 South Clark Street, Chicago, Ill.

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Assistant Editor:
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 9357
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 430, 122 East 42nd St.
Telephone CALedonia 5-4438
New York, N. Y.

Central Advertising Manager:
W. H. SANDERSON
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

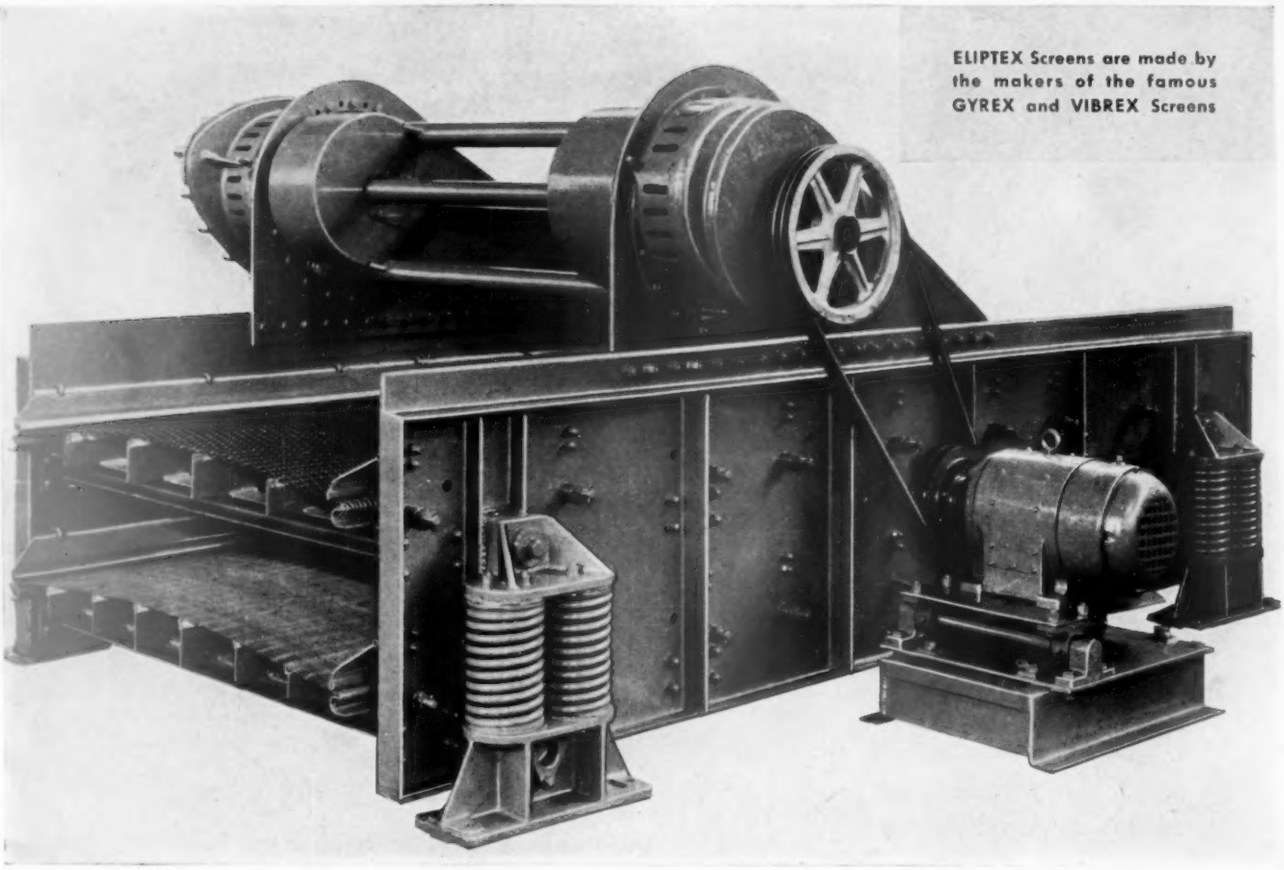
Advertising Representatives:
D. R. EGBERT
Chicago, Ill.

W. H. GRUBBS
Western Pacific Bldg.
Telephone Prospect 3746
Los Angeles, Cal.

DUNCAN A. SCOTT & CO.
Mills Bldg.
Telephone Sutter 1393
San Francisco, Cal.

Field Representatives:
A. C. PETERSEN
J. K. GARESCHE

MEMBER AUDIT BUREAU OF CIRCULATIONS

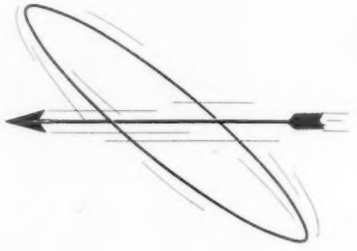


Patent applied for.

5' x 12' Double Deck Eliptex Screen

ELIPTEX SCREEN

closer grading, yet requires less area, less headroom, less power



The secret of ROBINS ELIPTEX Screen lies in its unique elliptical motion, uniform throughout. This action propels the material forward, at the same time turning it over and over again, giving each piece countless opportunities to pass through the mesh. Hence a closer sized product. The design of vibrator is such that the screen runs smoothly and quietly, no bounce in starting and stopping. It is strong and simple in construction. Load not carried on bearings, hence long life. Wide range of sizes available in single and multiple decks. Write for full particulars and prices.

ROBINS MAKES

Conveyors, Elevators, Feeders, Hoists, Grab Buckets, Screens, Gates and their accessories.

ROBINS CONVEYING BELT CO.
15 PARK ROW, NEW YORK, N. Y.
Offices in principal cities

MATERIAL HANDLING ROBINS EQUIPMENT

Plead Not Guilty to Price-Fixing Charge

SETS APRIL 16 AS TRIAL DATE

Pleas of not guilty to an indictment charging conspiracy to violate the Federal anti-trust laws were made by the Long Island Sand & Gravel Producers Association. eight corporations and twelve individual defendants during February in Federal Court at New York City. Judge John W. Clancy fixed bail for the individuals at $500 each and put the cases over to April 16.

The indictments were returned on November 22 as an early result of an inquiry into the building industry by members of the anti-trust division of the attorney-general's office. Said to control some 60 per cent. of the New York metropolitan wholesale sand-and-gravel market, they were accused of conspiring to raise the prices of their product. The conspiracy began in September, 1938, according to the indictment.

Reconstruction of Alsen Plant Nears Completion

Extensive improvements, said to have cost nearly $2,000,000, are nearing completion at the Alsen, New York, plant of the Lehigh Portland Cement Company.

Operations are expected to get underway late this spring or early in the summer.

Hawaiian Gas Products Buys Waianae Plant

Hawaiian Gas Products, Ltd., of Honolulu has acquired the Waianae Lime Company. The Waianae plant was the leading producer in the islands until Hawaiian Gas Products entered the industry a little more than a year ago.

According to Allan Renton, president, the Waianae plant, located about 30 miles from Honolulu will be shut down, but lime rock from the quarry will be transported to the main plant at Honolulu. The concern will have an output of about 10,000 tons of hydrated lime per year in the future. The CO_2 is made into "dry ice."

Eventually the Waianae installation will be converted into a cement-manufacturing unit, it is reliably reported. Tests of the deposit have shown it to be ideal for making Portland cement.

Bliss Named President of Pennsylvania Group

Members of the Pennsylvania Sand & Gravel Producers' Association elected W. A. Bliss of the Dravo Corporation, Pittsburgh, as their president for 1940 at the annual meeting of the organization held Wednesday, February 14, at Harrisburg.

Alexander Foster, Jr., of the Warner Company, Philadelphia, was elected vice-president and Ray V. Warren. 711 Empire Building, Pittsburgh, was re-elected secretary-treasurer.

Coming Events

May 7-9. 1940—Cincinnati, O. Annual convention. National Concrete Burial Vault Association.

May 21, 22, 23, 1940—Chicago, Ill. Twenty-second annual convention, National Lime Association, Drake Hotel.

June 13, 14, 1940—White Sulphur Springs, W. Va. Fifth annual convention, National Industrial Sand Association, Greenbriar Hotel.

See Little Change in Cement Consumption

MAY IMPROVE BY EARLY AUTUMN

Consumption of cement during the first half of this year, it is estimated, should hold close to that of the corresponding period in 1939, when shipments aggregated 54,000,000 barrels.

The carryover of construction work from 1939 approximated that of the preceding year. New building also should be close to 1939 levels for the next few months.

Consumption of cement in the second half will probably exceed that of the current period. While the peak of contract awards is usually reached in March and April, actual construction activity reaches its highest level several months later, because of the lag between awards and actual construction. WPA expenditures, which are currently being reduced, are expected to expand after July, when 1941 budget appropriations become available.

Furthermore, road building will increase moderately in the second half because of the higher appropriation for Federal aid to roads in the 1941 budget.

Safety Congress to be in Chicago This Year

The National Safety Congress and Exposition will be held in Chicago in 1940.

Col. John Stilwell, president of the National Safety Council, which sponsors the Congress, has announced the dates as October 7 to 11 at the Stevens Hotel. This will be the twenty-ninth Congress, and the seventh to be held in Chicago.

The Congress each year attracts approximately 10,000 safety leaders from all parts of the country and from many foreign countries.

More than $10,000 is being spent by the Pacific Portland Cement Company in constructing a wharf and warehouse at Sacramento.

Ohio Gravel Men Hold Annual Convention

W. E. HOLE NAMED PRESIDENT

The annual meeting of the Ohio Sand & Gravel Association was held at the Deshler-Wallick Hotel on February 6. The president of the association, William E. Hole of Greenville, presided at each of the sessions.

The forenoon session included a talk on "Merit Rating" by George Hammond, a report by T. F. Kearns and a review of Federal legislation by Mr. Hole.

The luncheon program speakers were Hal G. Sours, assistant highway director; H. D. Metcalf, chief of the Bureau of Maintenance of State Highway Department, and R. C. Caley, secretary of the Ohio Good Roads Federation.

The afternoon program was devoted to a discussion of specifications, operations and testing of materials. These discussions were led by R. R. Litehiser and George D. Scheuneman of the Ohio State Highway Department.

The officers elected included: William E. Hole, president; J. H. Evans, vice-president; Stephen Stepanian, treasurer, and Claude L. Clark, executive secretary.

Directors elected were: W. O. Brewer, Chillicothe; H. C. Slater, Columbus; D. S. Foland, Dayton; H. D. Stillion, Zanesville; F. C. Fuller, Portsmouth; Earl Zimmerman, Cincinnati; Hal C. Knight, Akron; Ray Van Camp, Cincinnati; J. J. Gorman, Zanesville; Zain Armitage, Lebanon; Charles Oberle, Cincinnati; S. Stepanian, Columbus; W. L. Talbot, Chillicothe; E. P. Thomas, Navarre; W. P. Watson, Hamilton; J. H. Evans, Columbus; William Edward Hole, Greenville; Ralph Bowsman, Troy; L. C. Bull, Kinsman; C. W. Purdy, Killbuck.

Mallon to Direct Sales for Louisville Cement

John H. Mallon has been appointed sales manager of the Louisville Cement Company according to an announcement by E. D. Hill, president. As ex-lieutenant of artillery in the Rainbow Division, Mr. Mallon has been associated with the Louisville Cement Company ever since his graduation from Yale in 1919. During most of this time he has specialized on his company's national sales and promotional activities in behalf of Brixment, a masonry cement. He is recognized as one of the nation's authorities in this field, as well as in the field of natural cements, which are now attracting wide attention as a basis material in road construction.

Assistant to Mr. Mallon will be Homer L. Baker, for the past ten years a field representative of the Louisville company.

John H. Mallon.

The Roquemore Gravel & Slag Company of Montgomery, Alabama, has just established another ready-mixed-concrete plant at Montgomery.

Six new truck-mixers have been ordered to serve the new plant.

RECENT GOVERNMENT CONTRACTS FOR MATERIALS UNDER THE PUBLIC CONTRACTS (WALSH-HEALEY) ACT

Date of Delivery 1940	*Source of Supply	Government Agency	Commodity	Amount
2/29	Wm. P. McDonald Construction Co., Flushing, N. Y.	W. P. A.	Bituminous concrete	$19,020.00
2/26	John Meehan & Son, New York City	W. P. A.	Bituminous mixture	10,750.32
12/31	C. H. Peters, Fremont, Wis.	W. P. A.	Aggregate	10,524.80
10/31	American Limestone Co., Knoxville, Tenn.	Agriculture	Dolomite limestone	Indefinite
10/31	M. J. Grove Lime Co., Lime Kiln, Md.	Agriculture	Pulverized limestone	Indefinite
3/31	Amsden Co., Amsden, Vt.	Agriculture	Ground limestone	Indefinite
3/31	The Conklin Limestone Co., Inc., Canaan, Conn.	Agriculture	Ground limestone	Indefinite
3/31	Lee Lime Corp., Lee, Mass.	Agriculture	Pulverized limestone	Indefinite
3/31	Swanton Lime Works, Inc., Swanton, Vt.	Agriculture	Ground limestone	Indefinite
2/29	Lee Lime Corp., Lee, Mass.	Agriculture	Pulverized limestone	Indefinite
2/29	Hoosac Valley Lime Co., Inc., Adams, Mass.	Agriculture	Ground limestone	Indefinite
2/29	The Conklin Limestone Co., Inc., Canaan, Conn.	Agriculture	Ground limestone	Indefinite
6/30	Valentine Lumber & Supply Co., Springfield, Mass.	War Engineer Corps	Ready-mixed concrete	9,815.00
Indef.	Cleveland Quarries Co., Cleveland, Ohio	W. P. A.	Wall stone	10,597.25
6/4	Mississippi Materials Co., Jackson, Miss.	W. P. A.	Surface course	34,590.00
10/31	Bertha Mineral Div., New Jersey Zinc Co., Austinville, Va.	Agriculture	Agricul. limestone	Indefinite
10/31	Liberty Limestone Corp., Buchanan, Va.	Agriculture	Ground limestone	Indefinite
10/31	Clinch River Quarries, Inc., St. Paul, Va.	Agriculture	Agricul. limestone	Indefinite
10/31	The National Lime & Stone Co., Findlay, O.	Agriculture	Agricul. limestone	Indefinite
10/31	Basic Dolomite Inc., Cleveland, Ohio	Agriculture	Ground limestone	Indefinite
10/31	Greer Limestone Co., Greer, W. Va.	Agriculture	Ground limestone	Indefinite
10/31	Campbell Limestone Co., Gaffney, S. C.	Agriculture	Agricul. limestone	Indefinite
10/31	Maymead Lime Co., Shouns, Tenn.	Agriculture	Ground limestone	Indefinite
10/31	Beech River Quarries, Decaturville, Tenn.	Agriculture	Agricul. limestone	Indefinite
10/31	Anna Quarries, Inc., Anna, Ill.	Agriculture	Limestone	Indefinite
10/31	Southern Ohio Quarries Co., Peebles, Ohio	Agriculture	Agricul. limestone	Indefinite
10/31	Hopkinsville Stone Co., Inc., Hopkinsville, Ky.	Agriculture	Agricul. limestone	Indefinite
10/31	Radford Limestone Co., Inc., Radford, Va.	Agriculture	Ground limestone	Indefinite
10/31	Bruceton Lime Co., Bruceton, Tenn.	Agriculture	Agricul. lime	Indefinite
10/31	E. M. Edney, Pinewood, Tenn.	Agriculture	Agricul. limestone	Indefinite
10/31	Falling Spring Lime Co., Falling Spring, Va.	Agriculture	Ground limestone	Indefinite
10/31	Cedar Bluff Quarry, Cedar Bluff, Ky.	Agriculture	Ground limestone	Indefinite
10/31	Fred Holpp, Belmont, W. Va.	Agriculture	Ground limestone	Indefinite
10/31	Franklin Limestone Co., Nashville, Tenn.	Agriculture	Lime slag	Indefinite
10/31	Franklin Limestone Co., Franklin, Tenn.	Agriculture	Agricul. limestone	Indefinite
10/31	Cerulean Stone Co., Cerulean, Ky.	Agriculture	Agricul. limestone	Indefinite

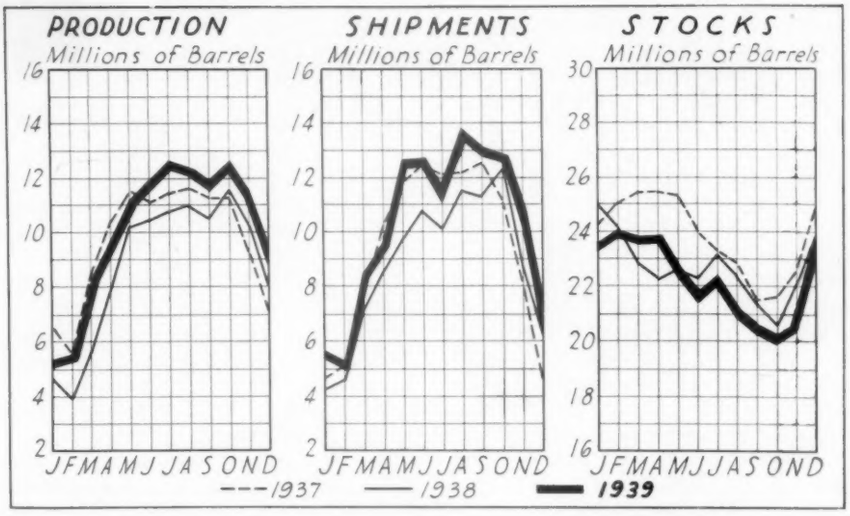
Increased Benefits for Silicosis Victims Urged

Legislation providing for larger benefits to silicosis victims was urged by Governor Herbert H. Lehman in his annual message to the 1940 New York state legislature.

"In 1936 we amended the workmen's compensation law to provide limited compensation for disability and death resulting from silicosis and other harmful dust diseases," Governor Lehman pointed out. "The benefits were limited to $500 for total disability and death, if they occurred during the first calendar month after the act became effective. And this amount gradually increased by $50 per month up to a maximum of $3,000. This maximum will be reached in the month of August of this year.

"In order to determine whether the benefits should be increased, the Compensation Insurance Rating Board has submitted figures on pay-roll exposure, the rate of insurance premium income and the incurred liability since the silicosis law was enacted.

"This report indicates that the benefits to injured workers can be generously increased without raising the cost of compensation insurance to the employers. Silicosis are the most pitiful victims of industry's failure to safeguard the health of its workers. Simple justice demands that the disabled victims of silicosis and their families be given substantially increased protection."



The Portland-cement industry in December, 1939, produced 9,488,000 barrels, shipped 6,772,000 barrels from the mills, and had in stock at the end of the month 23,495,000 barrels, according to the Bureau of Mines. Production and shipments of Portland cement in December, 1939, showed increases of 17.6 and 7.7 per cent., respectively, as compared with December, 1938. Portland-cement stocks at mills were 1.9 per cent. lower than a year ago. The preliminary totals of production and shipments for 1939 show increases, respectively, of 15.6 and 15.0 per cent. from the final totals for 1938.

New Wisconsin Studies Dispel Silicosis Fears

Studies in 41 plants in Milwaukee of 8,377 foundry workers by the Wisconsin Industrial Commission tend to show that silicosis does not cause tuberculosis nor need it be disabling, according to Voyta Wrabetz, chairman of the commission.

The commission's studies have yielded these conclusions:

With proper safeguards, the man who works in silica dust is almost as safe as he is walking the streets and breathing the city's dust.

Even without protection, and in high concentrations of deleterious dust, it takes years to develop silicosis.

By decreasing exposure through masks and dust removers no worker will became disabled in a lifetime of exposure.

It is safe to keep a man at work who has silicosis in an early stage.

Even where there are signs of inactive turberculosis, the man can be kept at some work for years or until his case becomes active. Periodical reëxaminations will protect that man, his employer and his fellow workers.

Continued examinations show that men with uncomplicated silicosis in the early stages show no change five years later where safeguards are used.

A man over 50 years of age with uncomplicated silicosis runs little risk of ever acquiring tuberculosis.

It is cheaper to the employer to keep silicotics at work to use their trained ability than to cast them aside and pay the expense of training new workers, of turnover in employment and of the unrest created by the wholesale discharge of men who appear well and are able to work.

Based on the results of this scientific study, the commission has adopted a provision that any employer who discharges a person with nondisabling silicosis shall be fined $3,500, as well as standards scientifically worked out for preëmployment medical examinations and post-employment periodical examinations by the commission for all compensable ailments.

Watchmen Held Subject to Wage-and-Hour Law

Watchmen are as much engaged in the production of goods for interstate commerce as those operating the production machinery, a Federal Judge in North Carolina has ruled in a contempt proceeding in the first instance where the question was raised in court of paying a watchman the minimum wage and overtime rates prescribed by the Fair Labor Standards Act of 1938 (Federal Wage and Hour Law).

American Aggregates to Handle Ray Sales

Ray Industries, Inc., and the American Aggregates Corporation have consolidated their sand-and-gravel operations in the Oxford, Michigan, area. The combined facilities provide for an annual capacity of 1,000,000 tons of material.

Production and sales will be handled by the American Aggregates Corporation.

Building Awards Show Only Slight Decline

PRIVATE CONSTRUCTION RISES

Private building and engineering contracts awarded in the 37 eastern states during the month of January amounted to $103,659,000, according to F. W. Dodge Corporation. This was almost exactly equal to the January 1939 figure, which was $103,757,000. There were moderate increases in private nonresidential building and engineering work and a moderate decrease in private residential contracts.

Contracts for publicly-financed construction declined 37 per cent. in dollar volume, as compared with January of last year, with a moderate increase in public residential building and decreases of considerable magnitude in public non-residential building and engineering work. The grand total of January contracts for all construction, $196,191,000, was 22 per cent. under the figure for the corresponding month of 1939, which was $251,673,000.

Commenting on the January record, Thomas S. Holden, vice-president of F. W. Dodge Corporation, in charge of statistics and research, made the following statement: "It is of interest to note that while the dollar volume of residential building contracts declined moderately as compared with January, 1939, there was a 14-per cent. increase in number of new family dwelling units contracted for, and that there was an increase in contracts for manufacturing buildings. A moderate rate for letting of private contracts during the first quarter and a continued marked decline in public construction have been anticipated by the construction industry, with the expectation that a more definite trend in private activtiy would be seen in later months."

Standards Reaffirmed for Screen-Wire Sizes

The Division of Simplified Practice of the National Bureau of Standards has announced that Simplified Practice Recommendation R147-33, Wire Diameters for Mineral Aggregate Production Screens, has again been reaffirmed without change by the Standing Committee of the industry.

This recommendation, which covers diameters of wire for production screens for mineral aggregates, became effective February 1, 1933, and was reaffirmed in 1936. These diameters, classified as light, standard light, standard heavy, and heavy, are for 21 specific clear screen openings ranging from ⅛ inch to 3 inches, inclusive.

Gypsum Sales Make Important Advance

1939 VOLUME TOPS 1937 AND 1938

As in previous quarters of the year, activity in the gypsum industry during the fourth quarter of 1939 continued well above that of the corresponding period of 1938. The twelve-month total volume of business not only surpassed the total for the preceding year but even topped that for 1937 by a comfortable margin, making 1939 the best year of the gypsum industry in the decade just ended.

Of the major classifications reported to the Bureau of Mines, sales of all calcined gypsum building products were higher in 1939 than in 1938 with the more important products, basecoat plasters, lath, wallboard, and tile showing large gains over the preceding year.

Total uncalcined sales, chiefly crushed gypsum for Portland-cement retarder, likewise exceeded those of 1938 by a substantial tonnage. The total quantity of industrial or manufacturing plasters sold or used in 1939 fell below that of 1938 by 13 per cent., but the decline in this group, actually only 16,931 short tons, was too small to offset materially the overall volume.

A Method for Removing Flat Gravel Particles

The problem of removing flat particles is one which has baffled many producers of sand and gravel and some crushed-stone producers as well. Ralph Hunt of the Screen Equipment Company, Buffalo, New York, told recently of a method developed by a sand-and-gravel producer in that state which is simple but effective. This producer was able to eliminate 90 per cent. of the flats in his gravel. A light spray of water from pipes at the head of each chute leading from the screen falls on the material coming off each deck. Enough water is used to wet the particles and keep the chutes moist, but not enough to flow down the chutes. This moisture causes the flat particles to stick to the chute and slide slowly down into a bin compartment directly below it. The round and desirable particles bounce actively down the chute into another compartment of the bin.

Installs New Packing and Loading Facilities

New storage, loading and packing facilities are being installed at the Hudson, New York, plant of the Lone Star Cement Corporation, replacing a structure that has been in service since 1911.

When completed the facilities will make it possible to load 24 railroad cars at one time. Gravity flow from the cement silos will be employed for bulk-loading the cars. A railroad scale will be installed for use in weighing cars before they leave the plant, saving time formerly lost by stopping cars at weighing points on the railroad.

Also included in the program are new unit coal mills for direct firing of the rotary kilns. This equipment will make it possible to dispense with the old driers and coal-grinding equipment.

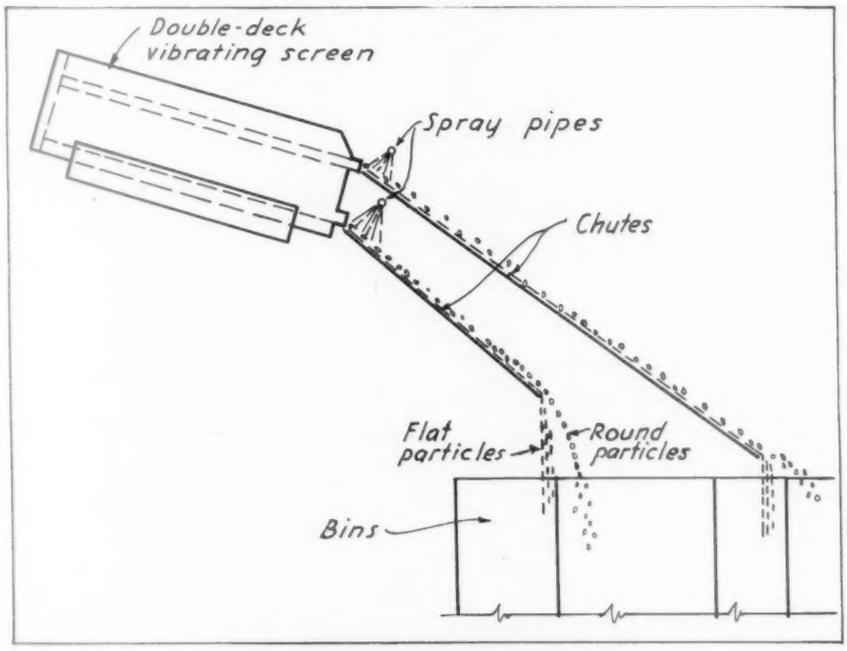


Diagram showing method for removing flat particles from material.

Industrial Sand Assn. to Convene in June

PICK WHITE SULPHUR SPRINGS

The fifth annual convention of the National Industrial Sand Association will be held at The Greenbrier, White Sulphur Springs, West Virginia, on Thursday and Friday, June 13 and 14, 1940.

The dates selected for the convention are those which the Board of Directors thought would be most convenient to all concerned. It was felt that the membership would approve holding the convention this year at a resort, because it is planned to concentrate on intimate discussion of industry problems, and it is also planned to arrange the convention in such a way as to allow the members and their wives to utilize the fine recreational facilities at White Sulphur Springs.

The association is seeking the advice of all member companies concerning the topics which they believe should be incorporated in the program. Merchandising problems, operating problems, taxation, the importation of foreign materials which prejudice domestic producers, occupational disease legislation, physical examinations, specifications covering the use of products have been suggested for discussion.

Portable Plant Serves Operator in Wisconsin

W. J. Durnford, Bloomington, Wisconsin, recently put into service a large portable crushing-and-screening plant at Prairie du Chien, Wisconsin.

This Diamond Iron Works unit consists of a 15 by 24-inch jaw crusher with a 2½ by 5-foot apron feeder, a 26 by 20-inch roll crusher and a 4 by 8-foot single deck vibrator screen. The outfit is equipped with circulating, recirculating and delivery belt conveyors, and a vertical roto-lift elevator. It is a self-contained unit with a 4-cylinder, 100-horsepower Murphy Diesel engine mounted overhead. The outfit is equipped with dual pneumatic tired wheels and mechanical brakes.

Two Drowned as Barge Capsizes in East River

Two barge employees were drowned in the East River at New York City when a sand-and-gravel barge capsized a few weeks ago.

The barge, owned by the McCormack Sand & Gravel Company, turned over when its 500-ton cargo shifted during a heavy wind and strong tide.

CURRENT BUSINESS INDICATORS

Throughout January and the first half of February industrial activity declined from the high level reached in the closing months of 1939. The index of the volume of industrial production of the Federal Reserve Board, adjusted to allow for a considerable seasonal increase, slumped from the peak of 128 in December to 120 in January. Data available for the first half of February indicate a continued drop in the index.

Although this index is properly weighted to represent all industrial production, it is, because of the immensity of the steel industry, highly sensitive to fluctuations in steel output. Steel-ingot production, which was maintained well above 90 per cent. of capacity throughout most of the last quarter of 1939, has declined steadily since the peak of 94.4 per cent. for the week ended December 2. By the middle of February it was about 69 per cent., not far above the rate in late summer prior to the fall spurt. Plate-glass production in January also dropped considerably below the high levels of the latter part of 1939. The decrease in lumber production was attributed in part to unusually cold weather in January throughout most of the South. This same nation-wide cold spell was largely responsible for a rise in coal production. Cotton-textiles and meat-packing output remained about the same in January as in the closing months of last year. Automobile production was larger than usual for the month. Late in January and in the first half of February, however, as retail sales of new cars declined seasonally and dealers' stocks increased, the output of new cars slowed down.

The construction industry for the past few weeks has been in the seasonally dull period of the year, both in respect to actual building operations and to awarding of new contracts. The severe winter weather also has handicapped building, particularly throughout the South, where an interruption of construction schedules because of snow and low temperatures heretofore has been virtually unheard of. In general the construction industry is less favorably situated than a year ago when it was in a strong position as the result of a large volume of awards for publicly-financed projects. The value of construction contracts awarded in January, as reported by F. W. Dodge Corporation, was down almost 25 per cent. from January, 1939. The drop, however, was entirely because of the falling off in public spending, for privately-financed construction, although somewhat lower than in December, was approximately equal to that of January of last year. Residential contracts awarded so far this winter have been about the same as those in the comparable period of 1938-39. Factory-building awards have been above those of a year ago but there has been by no means a stampede to increase existing productive capacity.

Opinion seems to be divided as to the desirability of plant expansion. Some business leaders feel that the continued uncertainty in Europe as well as the domestic political situation make new industrial building at present a hazardous undertaking. Others have expressed the opinion that the availability of capital at low rates of interest makes this an opportune time for enlarging industrial facilities. Irrespective of the rights and wrongs of the questions it seems evident that American business leaders have acquired a cautious conservatism that was not apparent throughout the 'twenties.

The trend of employment and payrolls in January was downward, offsetting to some extent the sharp gains made in the fourth quarter of 1939. Commodity prices in general were somewhat lower or unchanged. Retail sales and freight-car loadings also dropped somewhat more than seasonal. Exports, however, continued at a high level; cotton in particular was in great demand abroad.

Although it was quite generally conceded that business would not continue indefinitely at the peak levels maintained in the fourth quarter of 1939 the magnitude of the slump in the first six weeks of 1940 was not foreseen. The Bureau of Agricultural Economics took cognizance of the situation about the middle of February and stated in a generally optimistic report on the business outlook that the recession would be arrested in time to prevent any major decrease in purchasing power. In fact, the bureau even went so far as to point out the potential beneficial effect of the production slump in restoring a better balance between output and distribution.

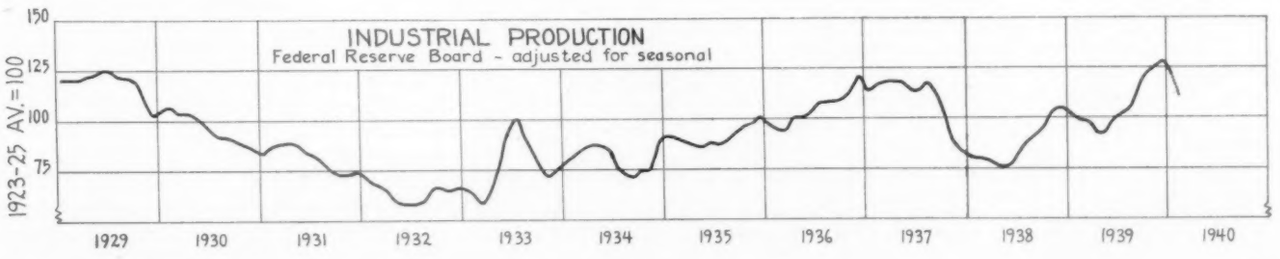
In commenting on the fact that the industrial decline has had little or no effect on the consumer demand for farm products, the bureau went on to say:

"Inasmuch as consumer buying is holding up well, commodity prices in general do not appear to be in a particularly vulnerable position, and business men in general will probably desire to maintain adequate inventories against the contingency of future wartime price advances. The present decline in output is not looked upon as the beginning of a severe and prolonged depression."

A similarly optimistic view of the current business situation also has been expressed by the United States Chamber of Commerce. Referring to February as the "winter solstice for business" the chamber made an important point of the fact that February, 1940, found business at a higher level than at the same period in 1937, the most recent year of near-boom activity in the opening quarter. Commenting further on the relation of present conditions to those of 1937 the chamber stated:

"Moreover, the adverse factors which were present in early 1937, and which later in that year brought abrupt reversal, not only in business but in prospects for a balanced Federal budget and full employment, are not now in evidence.

"Such adverse factors as exist to-day are of a different sort, such as uncertainties due to war abroad, but are not likely to have results in the United States such as were produced by domestic influences in 1937."



EDITORIAL

The Engineer and Social Problems

IN this day of intensive specialization in all branches of knowledge the average engineer works in an area wherein the application of his special talents and education is closely confined. In spite of this narrow circumscription of the field of his activity, the profession of which he forms a part takes a wide view of his function and usefulness. As the American Engineering Council once defined it, engineering is "the science of controlling the forces and utilizing the materials of nature for the benefit of man, and the art of organizing and directing human activities in connection therewith." It is something more than merely "the discovery through research of laws, and the formulation of principles and methods of utilizing them, through the design, construction, maintenance and operation of mechanical and other devices," as a member of the Taylor Society has described it. The modern engineer is tending to become more and more the true professional man who, in the words of Huxley, "applies science and education to meeting the wants of man."

Men trained in engineering are stepping over the bounds that generally surround their work, and as a result the principles that underlie it are being applied in fields that have not been considered technical. In the administration of business enterprise they have shown an aptitude for management that gives some hint of what the so-called "engineering mind" can do when faced with problems that are not directly concerned with mechanics and materials. A recent investigation of the educational backgrounds of the presidents of large industries made by Dr. Karl T. Compton revealed that of 235 presidents of industrial concerns who had received college educations no fewer than 151 had been trained in engineering or technical schools. Engineers are reaching still farther beyond the limited fields set out for them by their academic training, so that we encounter more often than formerly the terms "human engineering" and "social engineering."

WHAT engineers have done in the field of management has been accomplished in the interest of individual, competitive enterprises. Economic circumstances—that is, the economic interests of their employers—have, of course, dictated the objectives which they have pursued as well as the fields in which their studies have been made. Conditions in the market place have determined how well their work was to be done, whether their designs were to provide maximum serviceability or lowest production cost. Where engineers would normally, on account of their training, natural predisposition and ethical standards, strive to approach as closely as possible to perfection in their designs, they have felt the repressive influences of business competition. In such ciricumstances engineering has been hampered by the spirit of compromise, the necessity of producing tools, machines and other products not as good as they can be made but about as good as they can be made within the cost-of-production limits set by competition. Even when these conditions do not force a sacrifice of quality in favor of price, other restrictions on the free utilization of engineering skill and knowledge are imposed by special circumstances, such as agreements between manufacturers to retard normal improvement in an art or a product by withholding new developments from the market. The pooling of patents, as in some of our largest industries, acts as a staying hand on the initiative, the inventiveness, and the social-service aims of engineers. In such cases engineering talent, which should be free from restraining influences, if it is to be of greatest service in the broadest sense, is applied as a sort of glorified draftsmanship and is valued accordingly.

It is not to be wondered at, and certainly not to be criticized as evidence of a lack of social consciousness, that engineers as a class have been indifferent to social problems. The narrow and highly-specialized utilization that has been made of their abilities has produced inevitably a narrowness of viewpoint which practically precludes the development of an interest in problems affecting general welfare. Preoccupation with matters whose importance is measured in terms of profit and loss closes the door to broader applications of the principles of their training. Skills habitually devoted to the furtherance of private interests can not easily be transferred—certainly they do not automatically step over—to the field of public interest.

BUT the interests of engineers are being broadened by changing conditions and the shifting of emphasis from private to public concerns which characterizes the thinking of to-day. As early as 1921 the problem of unemployment was turned over for study to engineers by an American President who, himself an engineer experienced in social service, had seen something of the possibilities of applying engineering—that is, scientific-research—principles to problems of social welfare. From the work he conceived, organized and directed three surveys designed to "enlarge the general understanding of our economc system and to stimulate the continuing reduction of unemployment" resulted: (1) a study of economic cycles and unemployment, (2) a study of seasonal operations in the construction industry, and (3) a survey of recent economic changes. These studies presented problems in fact finding, a field in which the engineer can display his valuable abilities, knowledge and experience, but they did not extend, as they should have done, to a consideration of the advisability of applying the engineer's basic principle of design to the social problem as a whole. Had these investigators been allowed to prosecute their studies to the conclusions toward which their evidence pointed—a natural step which most of them probably wished to take—they would doubtless have afforded an example of the work of the best type of "engineering mind," which Stuart Chase has called "professional, not commercial;" the type "that is done with false modesty and has the courage to accept the job of taming the billion wild horses which Watt let loose; that thinks straight and hard; hates waste and confusion, dirt and despair; that never stoops to the shoddy or the adulterated."

Men engulfed in the mathematical and physical problems of machine and structural design, men concerned almost exclusively with the efficiencies of their mechanisms, methods and materials, can not be expected to be deeply concerned with the social consequences which the use of them entails. To an engineer a new machine, a new process, is useful or useless according to the extent to which it displaces, or avoids the use of, human labor. That is the work for which he is employed; it is the standard by which he is judged. The extent to which its use may lead to unemployment has not been considered his problem.

Present-day society is strongly marked by the influence exerted on it by the engineer as exemplified by the developments of the machine age. But in this evolutionary process he has been the servant of enterprise. The society of the future—perhaps the very near future—will also bear the evidences of the engineer's work, but in it he is more likely to serve as the master of enterprise. While he understands his great potential power in the service of business enterprise, he still only vaguely realizes the social responsibility which such service imposes.

By W. E. TRAUFFER

Missouri Portland Cement Co. Builds Outstanding Gravel Plant at Memphis

MANY new sand-and-gravel plants are built each year, but it is seldom that one stands out above the others as does that of the Missouri Portland Cement Company at Memphis. This new plant is unquestionably one of the show places of the industry and with all connected operations shows the result of careful planning and has that neat and attractive appearance which somehow seems to be inseparable from sound engineering. The main objectives were simplicity, efficiency and flexibility and, considering the difficult conditions under which the plant must operate, these have certainly been achieved. The plant is capable of meeting any specifications for quality or cleanness of product. It has a capacity of 1,000 tons per day of finished salable material.

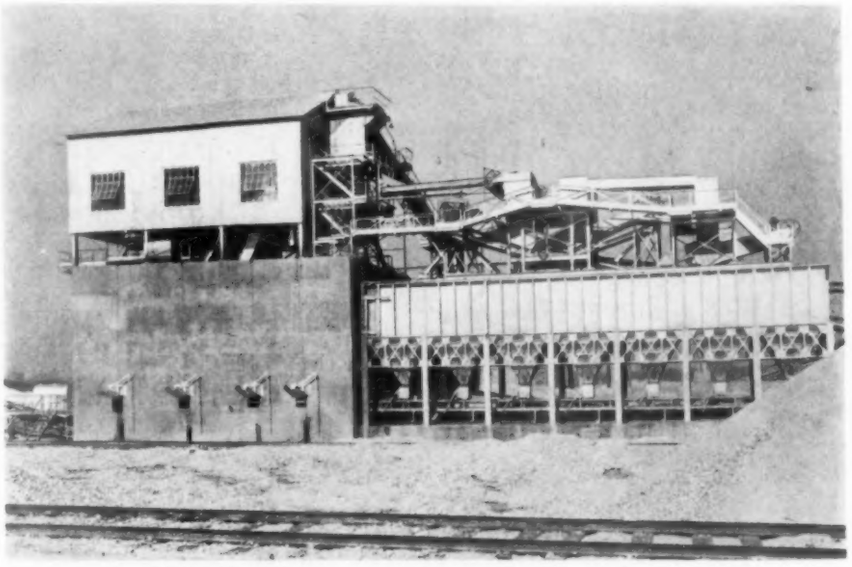
The history of this company in the sand-and-gravel business dates back to the "dark ages", when concrete was made by "rule-of-thumb" methods. Operating as the Union Sand and Material Company, of which the late H. L. Block was president, for years the company dredged sand and gravel from the Mississippi and Meramec Rivers near St. Louis before operations were begun in the Mississippi River near Memphis in 1907. In the same year this company bought out the St. Louis Portland Cement Company and in 1917 the present name of the Missouri Portland Cement Company was adopted. In 1921 river operation at Memphis was abandoned and in its place a plant was built in the Wolf River bottoms not far from the present plant.

The company's deposit consists of 387 acres owned outright and, like other workings in the Wolf River bottoms, is a stream deposit of glacial origin. Some timber had to be cleared away. The overburden consists of from 3 to 4 feet of silt above normal water level. Under this level is 18 feet of sand and 24 feet of sand and gravel down to a bed of white clay. All the gravel and an approximately equal amount of sand can be marketed, totaling about 25 per cent. of the total amount of material dredged.

When the old plant was operated the sand and gravel were excavated by a Diesel-powered dredge while an electric dredge was used for stripping. The Diesel dredge was then loading 1,000-ton barges which were hauled to shore by a cable line. The haul had within the last few years become too long for practical operation and this system had to be replaced by some other method. The decision to use a dredge-line and conveyor system had considerable influence on the design of the plant.

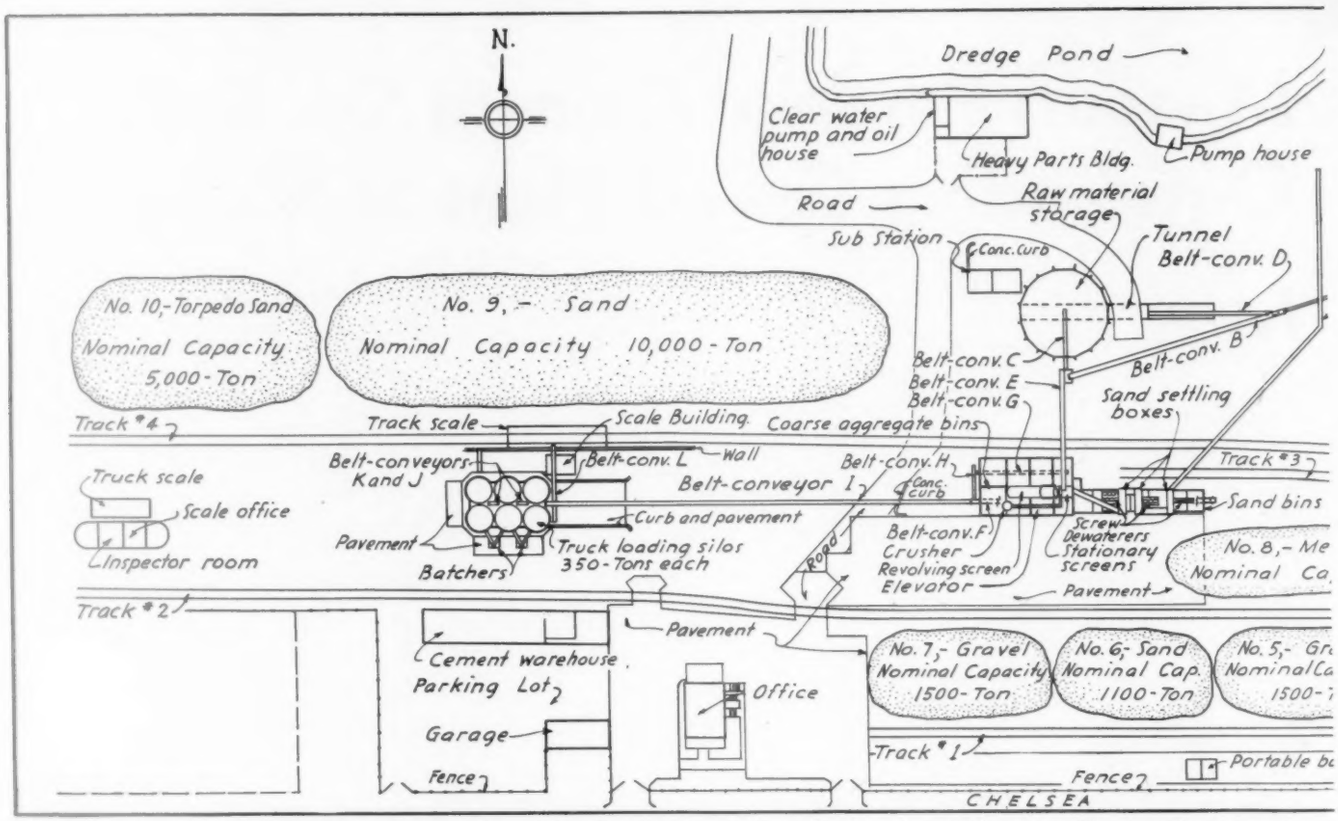
When the new plant was decided on the electric dredge was redesigned and a new 12-inch pump and motor and a ladder were added. This dredge is now used for sand-and-gravel production. The Diesel dredge, which has been kept in first-class condition, was not changed and is now used for stripping. This dredge is equipped with a 15-inch Ellis dredge pump which is direct-driven by a 425-horsepower Busch-Sulzer Diesel engine operating at 265-r.p.m. through a Cutler-Hammer magnetic clutch. This engine also drives a Westinghouse 25-kilowatt generator and an exciter. The electric current generated is used to operate the Morris revolving cutter head and the 5-drum Morris hoist from which the nozzle, 2 spuds and 2 shore-lines are operated. The dredge has a 32-foot by 88½-foot American Bridge Company steel hull. The silt and sand overburden is pumped through a 14-inch pipe-line to natural low ground.

The electric dredge has a 30-foot by 49½-foot, 3-compartment steel hull. It has a 12-inch heavy-duty Morris pump which is driven by a 400-horsepower, 514-r.p.m. volt General Electric motor. Individual electric motors drive the 75-foot Eagle Swintek screen-nozzle ladder, the 3-drum Lidgerwood hoist which operates the boom and the 2-shore-lines, and other equipment. Power cables and



The main building with gravel-sizing and crushing equipment over concrete bins at left. At right are the sand-settling tanks and screw dewaterers over steel bins.

The electric sand-and-gravel dredge which supplies the plant. The 75-foot screen-nozzle ladder at right is shown raised for inspection.



This plan of the property of the Missouri Portland Cement Co. illustrates the efficient utilization of available space. The concrete pavement, roadways and drives are shown.

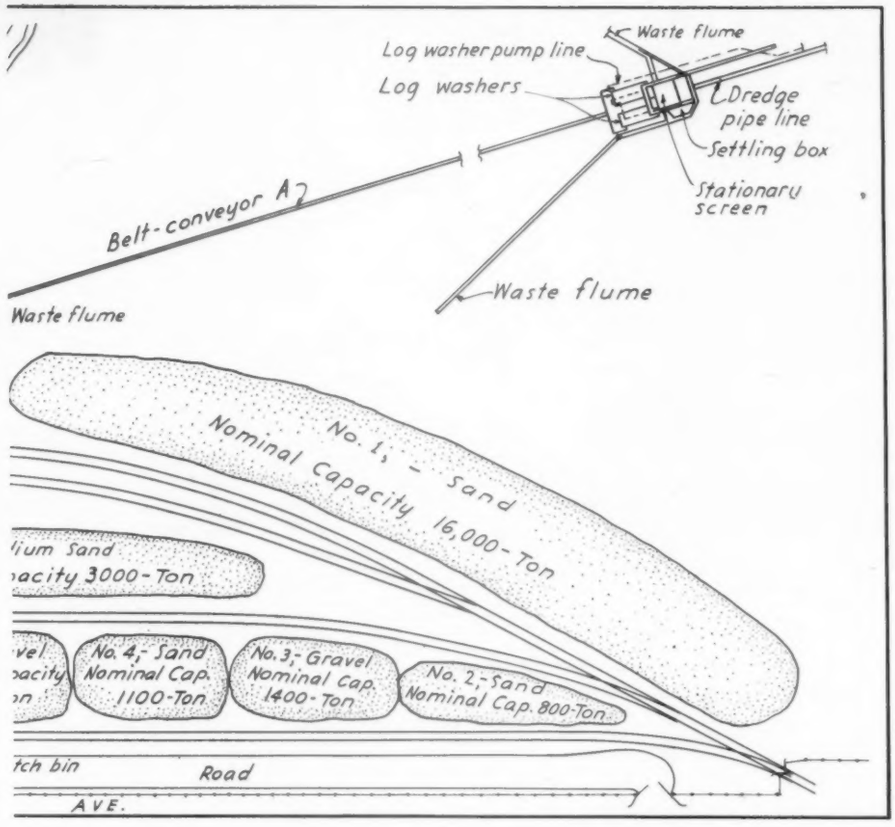
signal wires are carried on the rectangular steel pontoons which support the dredge pipe-line. Transformers on the dredge reduce the 2,300-volt current to 440 volts for the small motors. A motorboat is used to service the dredges and their pipe-lines.

The high percentage of waste makes it necessary to operate the electric dredge 16 hours daily to keep the plant supplied for 8 hours of operation and this is done in such a way as to eliminate "peak" loads. Power is purchased through the Memphis Light and Power Division of the Tennessee Valley Authority.

The dredge now pumps through 850 feet of 14-inch pipe from which the sand and gravel are discharged at a vertical head of 35 feet into a breaker box. The pipe-line enters the bottom of the box at an angle of 45 degrees with the vertical, a rail lining breaking the force of the flow. The material overflows a velocity-breaker plate to a 12-foot by 16-foot stationary screen with Tyler Ty-Rod ¼-inch by 4-inch slotted wire cloth followed by Ludlow-Saylor Statru cloth with 3/16-inch by 4-inch openings. About half of the sand passing through this screen goes to a waste flume. The other half goes into a settling box, which settles out about 75 per cent. of the sand fed into it, the remainder overflowing to waste. Formerly this excess sand was wasted at the dredge but, due to the 42-foot depth of the face, this material got in the way of the fresh material. The sand settled out, amounting to about three-eighths of the total sand dredged, is discharged into a series of two 20-inch by 15-foot Eagle single-screw dewaterers. The dewatered sand is discharged on the main conveyor to the plant. The gravel which passed over the stationary scalping screen goes to a pair of Telsmith 12-inch by 18-foot log-washers, from which it is discharged on this conveyor. The

Aggregates being discharged from main plant bins on conveyor to loading silos.

This view shows the reclaiming conveyor (right) which feeds stored raw material on the main conveyor to plant at left.



water used at this scalping station is supplied by a 1,000-gallon per minute pump.

The belt-conveyor (A) to the plant is 750 feet long and is inclined slightly at its discharge end to feed a 135-foot inclined belt conveyor (B). The material can be discharged from this second conveyor either directly on a conveyor (E) to the processing plant or through a chute on a 30-foot conveyor (C) which discharges it into an intermediate, or surge, storage bin.

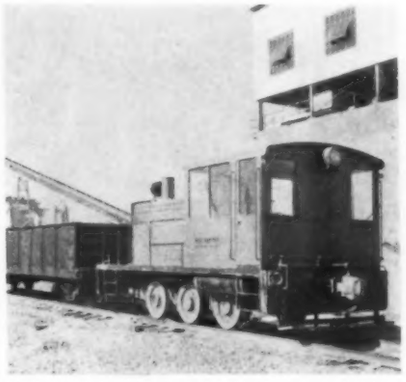
This bin is a 16-sided ground-level structure made of laminated wood coated with tar and pitch. Vertical timbers and circumferential tie rods are used to brace this structure, which is also tied in with steel rods to a concrete reclaiming tunnel under it. It has an inside diameter of 50 feet and a live-storage capacity of 1,200 tons.

Material is reclaimed through six openings in the top of the tunnel, each of which has quadrant gates. A 135-foot inclined conveyor (D) returns this stone on the conveyor (B) already described. Another opening in the top of the tunnel outside the bin structure is used to feed waste or spillage stone back into the processing circuit.

The conveyor (E) to the processing plant, which was previously mentioned as also receiving material from conveyor B, is 65 feet long. Material is discharged from it on a washing table consisting of two decks of inclined stationary screens 6 feet wide and 14 feet long. Eleven Link-Belt spray nozzles arranged in three rows insure washing and screening efficiency. The top deck of this screen is used only to relieve the load and protect the bottom deck and is equipped with ⅜-inch wire cloth with No. 8 wire. The bottom deck has 2 feet of 5-mesh cloth with No. 14 wire, 8 feet of 5-mesh cloth, with No. 16 wire, and 4 feet of 4-mesh cloth with No. 16 wire. Ludlow-Saylor wire cloth is used.

The sand passing through the bottom deck of this screen goes through a flume with 500 gallons per minute of wash water into a series of three steel settling boxes connected by steel flumes. Each of these boxes is 4½ feet wide, 15 feet long and 5 feet deep.

The first box settles out coarse sand which is discharged through manually-operated swing gates adjusted for continuous discharge at the rate best suited to conditions. Two Eagle double-screw dewaterers reduce the moisture content of the sand before it is discharged into three of the seven-in-a-row 60-ton hopper-bottom compartments of the steel sand bin. In the flume ahead of the first settling box is a relief gate through which coarse sand pebbles and water can be diverted into the waste flume.



The 30-ton gasoline locomotive which is used for spotting and switching cars.

The second box settles out medium sand which goes to one double-screw Eagle dewaterer before being discharged into two storage compartments.

Fine sand is settled out in the third box and goes to a single-screw Eagle dewaterer before being stored in two bin compartments.

The raw-material storage with feed conveyor and chute. The tunnel reclaiming conveyor is at lower right.

FLOW SHEET AND TABULAR ANALYSIS OF THE MISSOURI PORTLAND CEMENT COMPANY'S GRAVEL PLANT, MEMPHIS, TENNESSEE

(Key numbers refer to corresponding numbers on accompanying flow-sheet.)

Operation	Key	Equipment	Make	Model Number, Size Capacity or Type	Power Service	Power Transmission
Stripping		Dredge	American Bridge	32-ft. by 88½ ft.		
		Engine	Busch-Sulzer	Diesel, 8-cyl., 425-hp.	Diesel, 257-r.p.m.	
		Auxiliary generator	Westinghouse	156-kv.-a.		Direct connected
		Pump	Ellis	15-in.	30-hp. G. E. motor	Cutler-Hammer clutch
		Cutter	Morris	Revolving, 12 in. by 35 ft.	20-hp. G. E. motor	Cleveland reducer
		Hoist	Morris	5-drum		Spurgear
		Pipe-line		14 in.o.d., No. 8 gage		
Excavating	1	Dredge		Steel, 3-compartment, 30-ft. by 49½ ft.		
		Pump	Morris	12-in., heavy-duty	400-hp. G. E. motor	Direct connected
		Cutter	Eagle	Swintek, 75 ft. long	30-hp. Westinghouse	Spur gear
		Hoist	Lidgerwood	3-drum	50-hp. Westinghouse	Spur gear
	2	Pipe-line		14 in. o.d., ⅜-in. wall		
Scalping and preliminary gravel washing	3	Screen (Gravel to 4, sand to $3a_1$ and waste)	Tyler	Stationary, 12-ft. by 16-ft., ¼-in. by 4-in. openings		
	4	Log-Washers (2) (to 5)	Telsmith	Dual, 12-in. by 18-ft. logs	50-hp. G. E. motor 50-hp. Westinghouse motor	V-belt spur and bevel gears
Sand washing		(From 3)				
	$3a_1$	Settling box				
	$3a_2$	Dewaterer	Eagle	Screw, 20-in. diam., 15-ft. long	15-hp. G. E. motor	V-belt spur and bevel gears
	$3a_3$	Dewaterer (To 5) from $3a_1$ and 4	Eagle	Screw, 20-in. diam., 15-ft. long		
Gravel Conveying	5	Conveyor (A)	Barber-Greene	Belt, 18-in. by 750-ft.	15-hp. G. E. motor	Barber-Greene chain and spur gear
	6	(From 5 and $6a_3$) Conveyor (B)	Barber-Greene	Belt, 24-in. by 135-ft.	15-hp. Wagner motor	Barber-Greene chain and spur gear
	7	(To 7 or $6a_1$) Conveyor (E) (To 8)	Barber-Greene	Belt, 24-in. by 66½-ft.	7½-hp. G. E. motor	Barber-Greene chain and spur gear
Intermediate storing	$6a_1$	(From 6) Conveyor (C)	Barber-Greene	Belt, 18-in. by 30-ft.	3-hp. Wagner motor	Barber-Greene chain and spur gear
	$6a_2$	Storage; Raw material		50-ft. diam., 1,200-ton live capacity		
	$6a_3$	Conveyor (D) (To 6)	Barber-Greene	Belt, 18-in. by 135-ft.	7½-hp. Wagner motor	Barber-Greene chain and spur gear
Gravel Washing and Screening	8	(From 7) Washing table and screen (Gravel to 9; sand to $8a_1$)	Ludlow-Saylor	Stationary, 2-deck 6 by 14 ft., ⅝-in. openings top, 5-mesh No. 16 wire bottom		
	9	(From 8) Screen (Oversize to $9a_1$, throughs to 10)	Allis-Chalmers	72-in. by 24-ft., 96-in. by 8-ft. sand jacket	25-hp. Westinghouse motor	V-belt and spur gear
Crushing	$9a_1$	Crusher	Telsmith	32 B	25-hp. Westinghouse motor	V-belt
	$9a_2$	Elevator (To 9)	Telsmith	No. 4, 38-ft. center to center	5-hp. Westinghouse motor	V-belt and spur gear
Gravel Storing and Conveying	10	Bins (8) (To $10a_1$ and 11)				
	$10a_1$	Conveyor (G)	Chain Belt	Belt, 24-in. by 131-ft.	5-hp. Wagner motor	Falk reducer
	$10a_2$	Conveyor (H) (To 12)	Chain Belt	Belt, 24-in. by 19-ft.	3-hp. Wagner motor	Falk reducer
	11	Conveyor (F) (To 12)	Chain Belt	Belt, 24-in. by 131-ft.	5-hp. Wagner motor	Falk reducer
Sand Classifying and Storing		(From 8)				
	$8a_1$	Settling box (coarse)		Welded steel, 54-in. by 5-ft. by 15-ft.		
	$8a_2$	Dewaterers (2)	Eagle	Double-screw, 15-ft. long (3)	15-hp. G. E. motors (2)	V-belt and bevel gear
	$8a_3$	Bins (3) (To 11)				
		(From 8)				
	$8b_1$	Settling box (medium)		Welded steel, 54-in. by 5-ft. by 15-ft.		
	$8b_2$	Dewaterer	Eagle	Double-screw, 15-ft. long	15-hp. G. E. motor	V-belt and bevel gear
	$8b_3$	Bins (2) (To 11)				
		(From 8)				
	$8c_1$	Settling box (fine)		Welded steel, 48-in. by 6-ft. by 15-ft.		
	$8c_2$	Dewaterer	Eagle	Single-screw, 15-ft. long	7½-hp. G. E. motor	V-belt and bevel gear
	$8c_3$	Bins (2) (To 11)				

(Continued on next page)

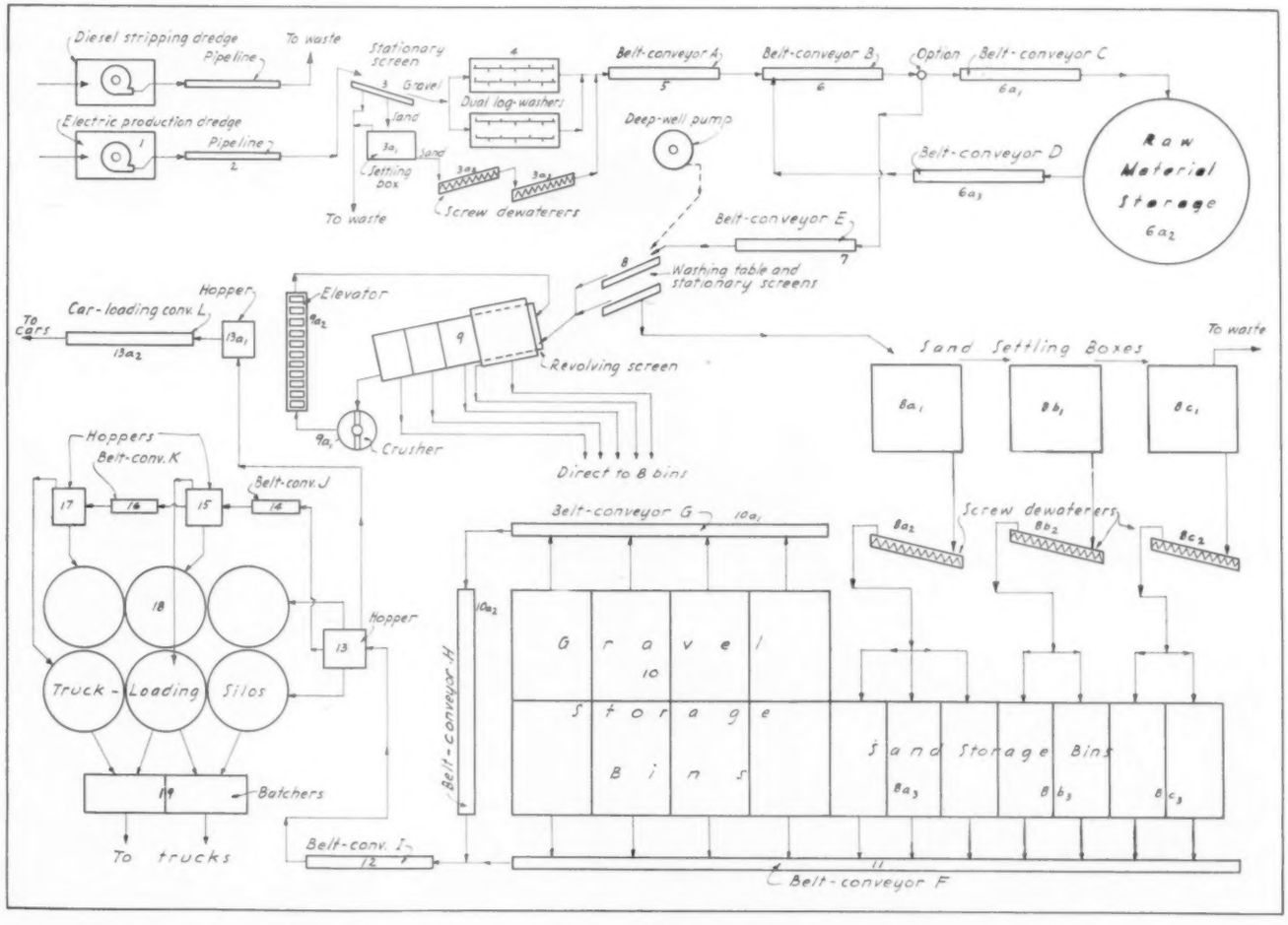
FLOW SHEET AND TABULAR ANALYSIS OF THE MISSOURI PORTLAND CEMENT COMPANY'S GRAVEL PLANT, MEMPHIS, TENNESSEE

(Key numbers refer to corresponding numbers on accompanying flow-sheet.)

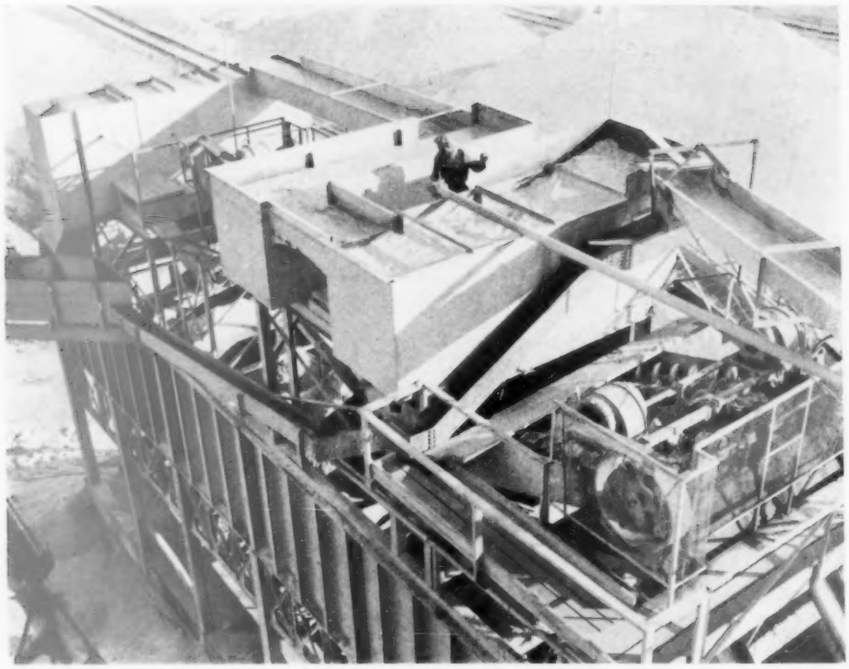
Operation	Key	Equipment	Make	Model Number, Size Capacity or Type	Power Service	Power Transmission
Conveying to Loading	12	(Gravel from 10 a_2, gravel and sand from 11) Conveyor (I)	Barber-Greene	Belt, 24-in. by 264-ft.	30-hp. Wagner motor	Barber-Greene chain and spur gear
	13	Hopper (To 13a_1 for car loading; to 14 and 18 for truck loading)				
Car loading	13a_1 13a_2	(From 13) Hopper Conveyor (L) (To cars)	Barber-Greene	Belt, 24-in. by 36-ft.	3-hp. Wagner motor	Barber-Greene chain and spur gear
Truck loading	14	(From 13) Conveyor (J)	Barber-Greene	Belt, 24-in. by 15-ft.	3-hp. Wagner motor	Barber-Greene chain and spur gear
	15	Hopper (To 16 or 18)				
	16	Conveyor (K)	Barber-Greene	Belt, 24-in. by 15-ft.	3-hp. Wagner motor	Barber-Greene chain and spur gear
	17	Hopper				
	18	(From 13, 15 and 17) Silos (6) (To 19 or direct to trucks)	Jones Hettelsater	Concrete, 16-ft. diam. by 50-ft., 350-ton live capacity each		
	19	Batchers (2) (To trucks)	Butler	70-cu. ft. capacity each		

All these dewaterers have 16-inch by 15-foot screws and their overflow joins that from the last settling box, which discharges through a flume to waste.

The material passing over both the stationary screen decks is discharged into a 6-foot by 24-foot Allis-Chalmers revolving screen, which is equipped entirely with round hole perforated plate. The sizes of openings used are varied according to conditions and demand. The usual arrangement is 8 feet of ⅜-inch, 4 feet of ⅝-inch, 4 feet of 1⅛-inch, 4 feet of 1¾-inch and 4 feet of 2 3/16-inch perforations. The 8-foot



Flow-sheet showing the flow of materials and the equipment in the plant of the Missouri Portland Cement Co. at Memphis, Tenn.



A view looking down on the sand-classifying department which shows the flume and the arrangement of the three settling boxes. Some of the dewatering screws are also visible.

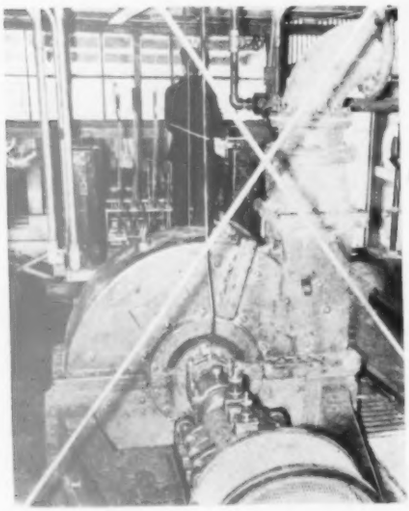
diameter by 8-foot outer sand jacket is usually equipped with perforated plate having ¼- by ½-inch holes.

The oversize gravel is discharged into a Telsmith 32 B gyratory reduction crusher, the product of which is fed back into the screen by a 38-foot Telsmith inclined belt-bucket elevator.

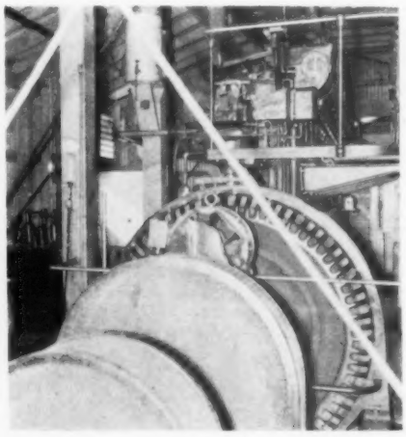
This screen produces seven graded sizes of materials, including four sizes of gravel, two of torpedo sand and a coarse sand. These products are discharged into a reinforced-concrete bin structure consisting of eight bin compartments with a live-storage capacity of 100 tons each arranged in two rows. The spouts under the screen are so arranged that any size of material produced can be discharged into bins in either row and two sizes can be discharged simultaneously into the same bin.

The south row of four bins is in line with the steel sand bins already described and under each row are seven inverted arc gates with counterweighted hinged spouts which are used for drainage when the gate is closed. Each of the seven sand compartments also has an individual gate. Under the north row of gravel bins is a 51-foot belt-conveyor (G) from which material is discharged on a 19-foot cross belt-conveyor (H) feeding the conveyor running to the loading building.

Material from the sand bins and the south row of gravel bins is discharged on a 131-foot belt-conveyor (F) which also feeds the loading belt.



The 15-inch pump and controls on the Diesel dredge used for stripping.



The 425-hp. Diesel engine on the stripping dredge. Generator, exciter, and magnetic clutch are shown.

The inclined conveyor (I) to the loading silos is 264 feet long. It discharges into a box-shaped hopper with four quadrant gates. Two side gates discharge into two of the six truck-loading silos and another feeds a surge hopper over a carloading belt-conveyor. The fourth gate feeds a series of two 15-foot inclined belt-conveyors each of which feeds two of six silos arranged in two rows of three each. The first belt-conveyor (J) discharges into a 3-way hopper which has side gates and spouts, whence the material goes to a pair of silos, and another gate feeds the second conveyor (K) which has a two-way hopper with gates and chutes to the last two silos.

The car-loading belt-conveyor (L) is 36 feet long and is carried on a steel framework over the loading track north of the silos. Aggregates are discharged from this conveyor through a chute and small hopper into the telescoping car-loading spout. The car being loaded stands on the 50-foot platform of a Howe track-scale which makes it possible to control the amount loaded. The scale-beam house is between the track and the silos and also contains the mechanism for controlling the spout, which is raised and lowered by a Shepard-Niles electric hoist. The spout can be used for stationary loading or can be moved back and forth to prevent segregation in loading. The reciprocating action is produced by a pitman drive on a rail-mounted car inside the building. This car can be pulled back in order to move the spout out of the way of the locomotive when switching is being done.

Air-operated gates under truck-loading silos which are operated from walkway at left.

Each of the six 350-ton live capacity reinforced-concrete storage silos has an inside diameter of 16 feet and is 50 feet high. The two interstices are not being used. Trucks are loaded in passageways under each of the two rows of silos through two Link-Belt Duplex clam-shell gates under each silo. Each of these gates is operated by 4-inch

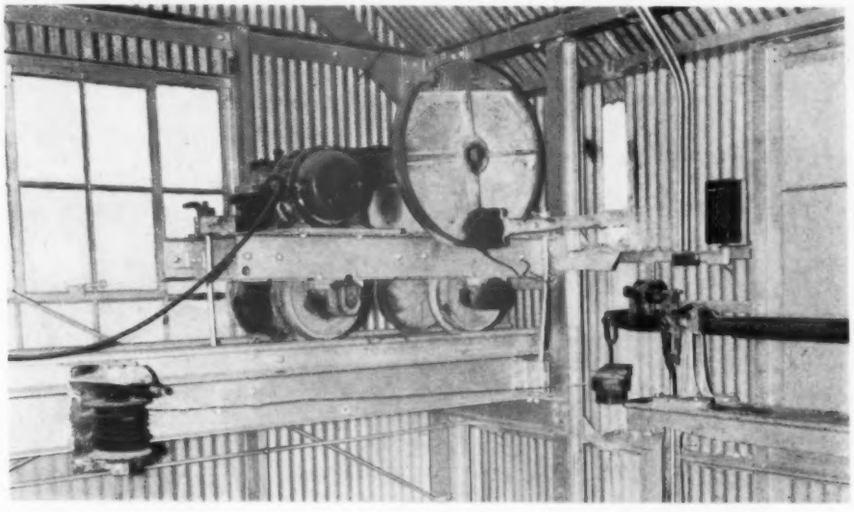
diameter Curtis Class J air-cylinders controlled by levers accessible from a concrete walkway in each passageway. Each gate is very slightly inclined so that any water draining out of the material in the silos will flow from one end of the gate into drip pans connected to the plant-drainage system. Air for the gates is furnished by a 6-cubic foot Gardner-Denver air compressor.

On the south side of the silos are two 70-cubic foot Butler weighing batchers, with 2-beam scales, which are mounted on a steel framework for truck loading. Each batcher is fed with gravel through a spout from one of the end gravel silos and a spout from the center sand silo. Openings have been left in the silos on the north side so that similar batchers can be installed at any time. These batchers are used for dry batching and for loading concrete truck-mixers owned by customers. Water for these mixers has been provided from a high-pressure tank, but a Bowser meter is being installed for this purpose. Extensive concrete curbing has been installed to protect the permanent concrete structures from traffic damage and at the same time prevent damage to trucks and tires.

The stock-piling system has been worked out with great care. Only material in excess of current needs has been stock-piled and this storage is used mainly as a reserve for times when the demand exceeds the plant's capacity. The storage capacity throughout the plant is about three times its present productive capacity, and a large proportion of this is assigned to finished material of all sizes, making it possible to supply all ordinary demands from plant storage. It is also planned to operate the plant the year around, weather conditions permitting, using the excess production of the cold weather for building up these stock-piles.

Shipments from stock-piles are made almost entirely in cars and they are laid out for economical and efficient loading. As can be seen from the accompanying drawing, all the stock-piles are served by one or two tracks and are also accessible by crawler-mounted equipment. The grades of sand and gravel likely to be ordered simultaneously or in combination are stored in adjacent piles for convenience in loading.

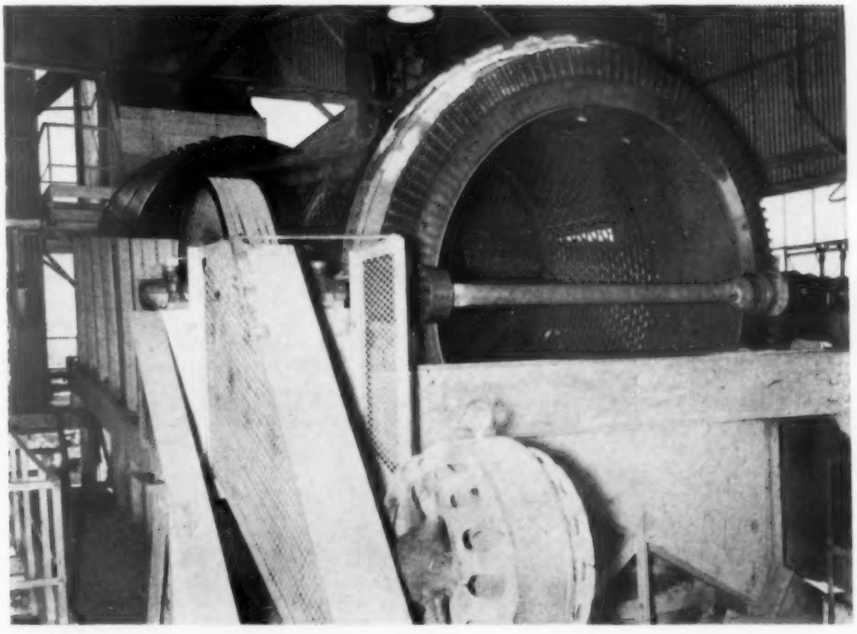
A Brownhoist gasoline locomotive crane with a 1½-cubic yard bucket and a 50-foot boom is ordinarily used for loading cars from the stock-piles. Two Koehring gasoline crawler cranes with ¾-cubic yard buckets are used for loading cars or trucks. They also serve a 40-cubic yard 2-compartment Butler batching bin, with a 75-cubic foot batcher, which is mounted on skids so that it can be moved to any desired location. A Davenport 30-ton gasoline locomotive is used for switching and for spotting cars for loading.



The car-loading-spout reciprocating mechanism on barney car which can be moved on track. Track-scale beam is at right.

A view of the plant with the reinforced-concrete truck-loading silos in foreground.

The two 70-cubic foot weighing batchers for loading dry batches and truck mixers.



The 6-foot by 24-foot heavy-duty revolving screen which does all of the gravel sizing. Washing table and return elevator from oversize crusher are in background.

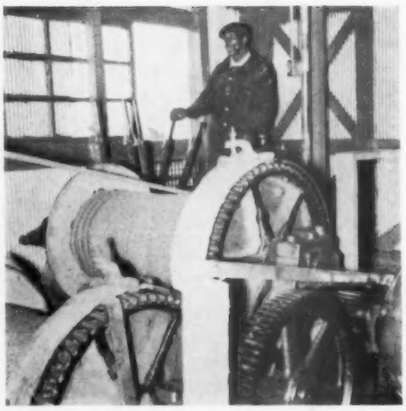
All truck shipments are weighed on a Howe truck scale with a Weightograph attachment. This scale has a 34-foot platform, long enough to weigh trucks and trailers. In the scale-house also is a well-equipped inspectors laboratory. Other buildings include the warehouse, a storeroom and a repair shop. The modern plant office fronts on the main street.

The plant in its entirety was designed by the engineering department of the Missouri Portland Cement Company, which also supervised its construction and the installation of all the equipment. The reinforced-concrete aggregate-storage bins and silos were built by the slip-form method. The two reclaiming belt-conveyors and the cross

The reciprocating spout loading gravel without segregation into a car on the track scale.

conveyor under the mixing bins were supplied by the Chain Belt Company. These conveyors and most of the other equipment in this plant are driven through Falk speed-reducers. All the other belt conveyors were supplied by the Barber-Greene Company complete with belts, integral speed-reducers, and steel-truss frames. All the idlers and pulleys have ball bearings.

A view in the scale-house showing scale beam and clerk making out ticket for driver.



The 5-drum hoist in the Diesel dredge which operates the nozzle, spuds and shore-line.

Every possible provision has been made for the safety and comfort of the company's employees. There is an active safety organization with a committee which holds regular meetings. It is the company's policy, carried over from its cement operations, that no new equipment can be started up before it has been inspected by the safety department. All the exposed moving parts of machinery are housed and hand rails are used wherever needed. No junk, dirt or waste material is allowed to accumulate in the plant or elsewhere, contributing considerably to the safety and well-being of the employees. An example of the thoroughness with which this is done is the high-pressure water line on all the conveyors with hose connections from which the conveyors and other equipment are washed down daily. All this dirt is sent to waste through a drainage system.

For the employees there are modern service facilities such as change-rooms, sanitary wash basins, toilets and drinking fountains.

Announces Winners in Guessing Contest

At the recent conventions at St. Louis, the Nordberg Manufacturing Company offered prizes for the best guesses on the number of tons of stone which had been crushed by a 7-foot Symons short-head cone machine. A section of manganese from the unit was on display to show the uniform wear and minimum percentage of scrap.

Winners among the sand-and-gravel producers were as follows: First prize—J. T. Ahearn, Dillman Industries, Inc., Caruthersville, Missouri; second prize—F. J. Cloud, W. R. Bonsal Company, Lilesville, North Carolina; third prize—C. W. Purdy, Killbuck Sand & Gravel Company, Killbuck, Ohio.

Among the crushed-stone producers, winners were as follows: First prize—J. Savage, Buffalo Crushed Stone Company; second prize—W. J. Martin, Miami Rock Products Company, Miami, Oklahoma; third prize—H. E. Rainer, Buffalo Crushed Stone Company.

Guesses ranged from 11,246 tons to 3,265,000 tons, according to Delbert Kay, advertising manager.

Census Will Record Mechanical Advance

With increased activity in the construction industry, the iron-and-steel industry, the railroads and many of the nation's other big stone-consuming industries, those engaged in quarrying are keeping a close watch on the markets, studying their trends and potentialities. Whatever the immediate prospects of business appear to be, one thing is certain: a complete record of last year's activities is essential to those in charge of production and sales to guide them in making future plans.

In January, 12,000 census takers were in the field calling on representatives of this and every other industry, including those which purchase the products of quarries, pits and mines. These 12,000 were the vanguard of an army of 130,000 enumerators which in April will collect the balance of the information to go into the Sixteenth Decennial Census—the most extensive enumeration of this Nation's population, resources and business ever undertaken. It will embody several major compilations:

The Census of Mines and Quarries; Census of Business and Manufacturers; the Census of Population, Employment and Income; a Census of Housing, which will be taken for the first time this year, in conjunction with the Population Census; the Census of Agriculture, and a Census of Drainage and Irrigation.

The recent developments of mechanization in pits and quarries will be recorded for the first time, through a special survey of this subject. This survey will concentrate on loading—the last major operation to be mechanized—and will be indispensable to production men as a measure of efficiency of modern loading methods. An inventory will be taken of mechanical loading devices—power shovels, drag-line excavators, scraper loaders, and other devices used on the surface; shovel loaders, scraper loaders and other types used underground. All loading machines will be classified by the kind of power used—steam, electricity or compressed air; and by dipper or bucket capacity. Scraper hoists will be classified by rated horsepower.

For the first time in ten years, statistics will be collected on the number and horsepower rating of all power equipment.

By W. E. TRAUFFER

Iron, Other Silica-Sand Impurities Removed by Concentrating Tables

A view of the West-Land Security Company's plant from the pit side with waste pile in foreground.

GLASS and similar products made from silica sand are manufactured in many sections of the country where sand free from iron and other impurities is not available. Where this iron occurs as a stain on the surface it can usually be removed by the acid-bleaching process, but when it is in the form of solid particles of free iron minerals other methods must be used. Such a problem confronted the West-Land Security Company when it built its new glass-sand plant at Tarbutton, Texas, late in 1937. This plant, located 20 miles south of San Antonio, furnishes sand to glass makers in the United States and Mexico.

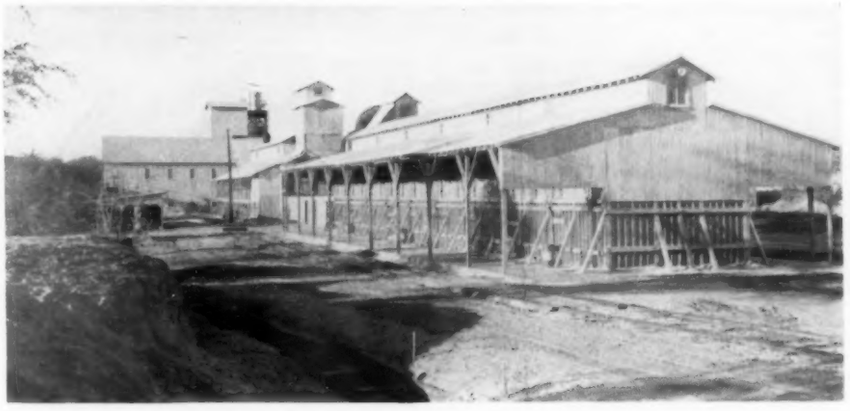
The deposit averages only 6 feet in depth but its extent guarantees sufficient material for many years of operation of the plant. Under the sand is a 12-foot bed of clay over more sand to an undetermined depth. The light overburden is carefully removed. Before the plant was built bank sand had been shipped from this deposit for several years. The sand in this deposit averages about 0.13 per cent. Fe_2O_3.

The tractor-drawn scraper hauling sand to the hopper from which it is loaded into cars.

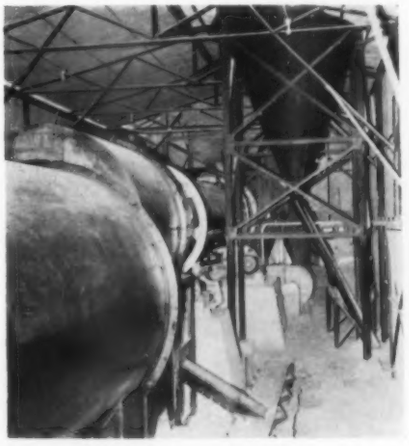
After studying the problem a combination of desliming and tabling methods was decided on. The problem of designing the plant and furnishing the major equipment was put in the hands of the Deister Concentrator Company and the Dorr Company. N. W. Gillies, operating manager, coöperated in this work. The equipment selected not only removes all but a trace of iron but also eliminates other objectionable minerals and foreign matter. The material wasted amounts to about 20 per cent. of the total. A number of improvements have since been made to improve the product further, including the installation of a rotary drier early in 1939. The iron content of the sand shipped has been reduced to an average of about 0.06 per cent. The main plant is built of wood frame and corrugated metal with concrete foundations. The new drier section is built of structural steel and corrugated metal.

A 1½-cubic yard Killifer rotary scraper drawn by an International Diesel tractor digs the sand and carries it to a hopper under which cars are loaded. Two 1½-cubic yard steel side-dump cars pulled by a Whitcomb-Fordson 2½-ton gasoline locomotive carry the material 600 feet to the plant. There the sand is discharged over a grizzly into a hopper from which it goes to a 65-foot belt-bucket elevator.

The raw sand, which is 98 per cent. minus 28 mesh, is discharged on a Deister Concentrator Company Leahy 3-foot by 6-foot single-deck heavy-duty vibrating screen equipped with 14-mesh wire cloth and Concenco spray nozzles. The oversize, consisting mainly of roots and other debris, is wasted. The sand



Another view of the plant from the opposite side. In the foreground is the dried sand storage and beyond it is the drying department.



A view alongside the drier showing discharge on belt-conveyor. Drier drive, fan and cyclone are in background.

A close view of the concentrating tables which are the final step in removing iron and other impurities from the sand.

which passes through the screen is discharged into a 30-ton bin which feeds a 4-foot by 7-foot Leahy heavy-duty single-deck vibrating screen with 20-mesh cloth and sprays. The over-size from this screen includes heavily-stained sand, which forms about 1 per cent. of the total amount of material, and is utilized for filtration and other commercial uses.

The sand which passes through this screen formerly went direct to a Dorr 16-foot turret-bowl classifier with a 12-foot rake. This machine is equipped with critical-size control which makes possible very close regulation of the maximum size of particles in the overflow. In this instance the material is being deslimed at 100 mesh. Recently a Jeffrey 16-foot drag-washer was installed ahead of the classifier to aid in the removal of silt, clay, etc. from the sand. The overflow of the washer and classifier is waste and goes into a tank from which a 3-inch Wilfley pump moves it through a 600-foot pipe-line to waste. Other waste material produced later in the flow also goes to this pump.

The product of the classifier goes to a 32-foot bucket-elevator which discharges it into a bin, whence it is fed to a 3-foot by 6-foot Leahy heavy-duty vibrating screen with 28-mesh cloth. The over-size sand goes into the tank feeding the Wilfley pump and is wasted. Material passing through this screen goes by gravity to a Concenco revolving distributor feeding the ten No. 6 diagonal-deck Deister-Overstrom concentrating tables. These have rubber covers and rubber riffles and remove additional iron, alumina, zircon and other impurities which also go to the Wilfley waste pump.

Some of the ten concentrating tables used in this plant with their feed pipes from the revolving distributor above.

The product of the tables goes by gravity to a 30-foot bucket-elevator serving a bin. Sand is fed from this bin to a Dorr 12-foot rake classifier from which the overflow also goes to the Wilfley pump. The product of this classifier is finished glass sand and is carried away on a 40-foot inclined belt-conveyor. This feeds a 40-foot horizontal belt conveyor which passes over, and distributes the sand into, long wooden storage bins which have a combined capacity of 800 tons. Sand fed to these bins has a moisture content of about 27 per cent. which is reduced by drainage to about 4 per cent.

The vibrating washing screen which removes heavily-stained coarse sand.

This sand is withdrawn from storage to a movable feed hopper from which it is discharged on a 96-foot horizontal belt-conveyor. A 39-foot Jeffrey bucket-elevator feeds the sand into a 60-ton steel bin, from which a Jeffrey-Traylor vibrating feeder regulates its flow into

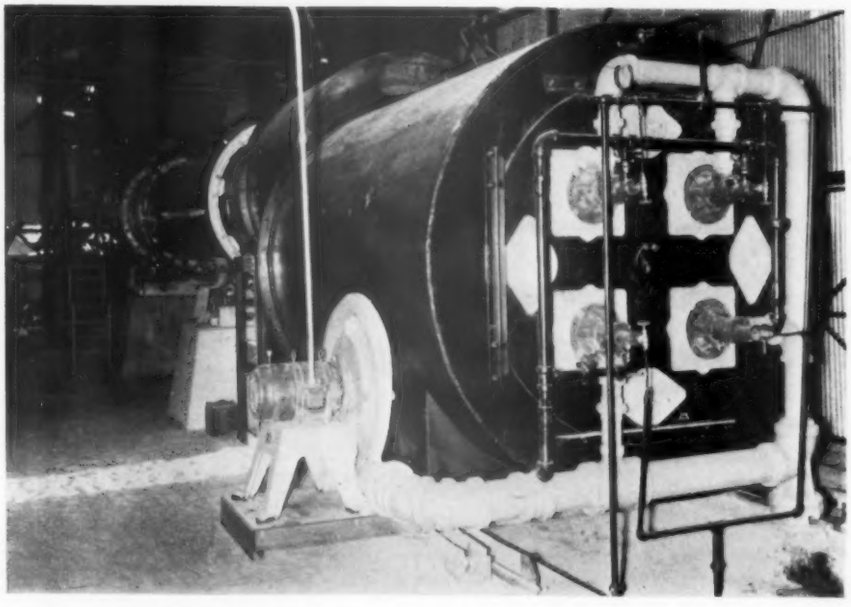
The vibrating feeder which regulates the flow of sand into the drier.

the Bartlett & Snow 54-inch by 29-foot direct-fired rotary drier. This is driven by a 10-hp. General Electric motor through a Falk reducer. A gasoline engine is used as a stand-by.

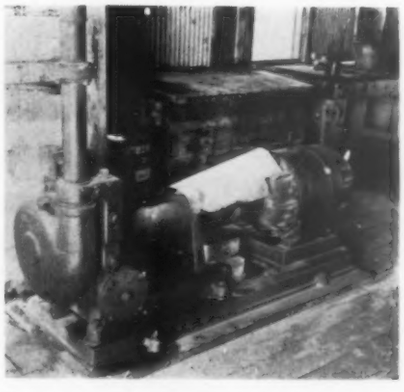
The drier has a 9-foot long furnace with four North American Company fuel-oil burners. All four burners are ordinarily used but any three can supply ample heat if one should go out of service. Between the drier and the firing chamber is a 4½-foot tempering chamber. An American Sirocco suction fan draws the hot gases from the drier through an 8-foot diameter Bartlett & Snow cyclone which precipitates fine dust.

The drier temperature is controlled

The 12-foot rake classifier which dewaters the sand before it goes to preliminary storage.



The rotary drier with four-burner furnace, tempering chamber and burner fan in foreground.



The 3-inch pump which handles waste material to dump.

manually by an operator who watches the consistency of the dried sand. It has been found that sand containing about 2 per cent. moisture when coming out of the drier will continue to dry to about ½ per cent. on its way to storage. The sand is discharged on a 35-foot Jeffrey belt-conveyor from which a 30-foot Jeffrey bucket-elevator feeds it to a 125-foot Jeffrey distributing belt conveyor. A plow distributes the sand into the 125-foot long covered storage bin which has a capacity of 1,000 tons. Sand is withdrawn from storage through ports to a Jeffrey portable belt-conveyor feeding an Ottumwa box-car loader which distributes the sand in the cars. A 60-ton car can be loaded in 2 hours. Before the drier was installed the sand was shipped in open cars with a moisture content of about 10 per cent. Drying had to be done by the consumer.

N. W. Gillies, Jr., Major W. O. Allen and N. W. Gillies, operating manager.

The single deep-well pump which formerly supplied all the wash water for this plant was able to supply only 200 gallons per minute. As a result water had to be recirculated and a thickener was installed and lime was used for complete clarification. This water was used only on the concentrating tables and the final classifier. Fresh water was used on the screens and in the bowl classifier. The installation of a second deep-well pump has improved this condition and less of the water is now used again, thus eliminating further use of the thickener. An acid-bleaching plant is being considered and may be installed at some future date.

Blockade Pinching Off Phosphate to Germany

The lack of noteworthy phosphate-rock deposits in Germany, combined with the existing British blockade of imports from overseas, seriously endangers the country's agricultural production. The deficiency in crude phosphate has worried German economists for some years and the present conditions have pushed this question into the group of major national economic problems.

Previously the heart of the problem was to get enough foreign exchange to pay for the imports, but now it is a question of getting enough phosphate by whatever means possible. Superphosphate manufacturers recently have been further handicapped by the growing shortage of sulphuric acid, due to the difficulty of importing adequate amounts of pyrites, from which the bulk of the German acid output is obtained.

The situation is worse at present than it was in 1914 because in recent years insufficient phosphoric acid has been increased by the intensive cultivation now practiced in raising intermediate crops and growing plants with roots penetrating deeper into the soil.

Germany gets phosphate from two main sources—basic slag obtained as a byproduct from smelting phosphatic iron ores, and superphosphate obtained from imported phosphate rock, apatite, etc. The prospects are that Germany's supplies of both basic groups of phosphatic fertilizer materials will decline in the future, certainly as long as the war continues.

Labor and Legal Problems Interest Crushed-Stone Men at Convention

THE first session of the 23rd annual convention of the National Crushed Stone Association opened January 22 at St. Louis with a discussion of business conditions by the regional vice-presidents. The details of the reports are summarized in the accompanying table. From the meager data available it would seem that crushed-stone production in the plants reported on declined in 1939; that prices, on the whole, exhibited little change, moving sometimes downward; that production utilized between 50 and 60 per cent. of the plant capacity available; that much more than half of the product went into highway construction and from 10 to 20 per cent. into railroad ballasting. The outlook for 1940 seems to offer a bigger output and better prices, although in several regions no important changes are expected.

Engineering Director A. T. Goldbeck and Administrative Director J. R. Boyd presented their reports reviewing the work of their departments in 1939.

Otho M. Graves, a member of the association's executive committee, utilized the time made available by the inability of Dr. David Friday to appear as scheduled to report on the rejection by the Wage and Hour Division of the Department of Labor of the association's application for exemption of the crushed-stone industry as a seasonal industry under Section 7 (b) (3) of the Fair Labor Standards Act of 1938. He said that there was difficulty in reconciling this rejection with the provisional granting of exemption to the sand-and-gravel industry, announced by the Wage and Hour Division on January 8. As petitions protesting the decisions of the administrators must be filed within 15 days after they are made, Mr. Graves asked for, and received, quick approval of his committee's recommendation that the association file by the next day (January 23—the "dead-line") a petition as the representative of crushed-stone producers "aggrieved" by the decision. Full details concerning the decision and its effects will be found in another article in this issue of PIT AND QUARRY.

At the greeting lunch, which followed the close of the morning session, Elmer Wheeler, president, Tested Selling Institute, gave a stimulating and amusing lecture on *Magic Words that Make People Buy*. He emphasized five points as important in any one's attempt to sell either himself, an idea, or a product.

First, he said, sell the sizzle of the steak, not the cow. Find the quality of the product that awakens the greatest emotional response.

Secondly, speak telegraphically. If your first ten words are not the right ones, you will never have a chance to speak the remaining 10,000.

Thirdly, "say it with flowers," dramatize your statements. Drop the square clothes pins you're trying to sell and prove that they will not roll. Pull at the buttons on the shirts you are offering and prove that they can't be torn off.

Fourthly, give your "prospect" a choice between one action and another action, not between action and inaction. Will he take delivery to-morrow or next week? Does he want to pay cash or would he like credit? Will he have one or two eggs in his malted milk?

Fifthly, watch your bark. The volume and tone of your speech are important. How you say it is as important as what you say. "What a *man!*" said the girl when she espied the new life-guard. *"What* a man!" said the housewife when her husband said the steak was overdone. *"What! A man?"* cried the old maid as she thought she saw one beneath her bed. "The same three simple words," said the speaker, but what a difference in the meaning is made by difference in tone and emphasis.

The Monday afternoon meeting was presided over by H. E. Rainer, Federal Crushed Stone Corporation, Buffalo. The first speaker was John N. Edy, executive assistant, Federal Works Agency, Washington, whose subject was *The Federal Public Works Program*. Mr. Edy reviewed the growing demand for a federal agency dealing

NATIONAL CRUSHED STONE ASSOCIATION
1940

OFFICERS

J. A. RIGG, *President*
Fort Spring, W. Va.

REGIONAL VICE-PRESIDENTS

W. M. ANDREWS (Eastern)
W. C. SPARKS (Central)
W. T. RAGLAND (Southeastern)
A. J. CAYIA (Northern)
PORTER W. YETT (Northwestern)
A. J. WILSON (Western)
R. S. WILSON (Southwestern)
N. E. KELB (Midwestern)

BOARD OF DIRECTORS

C. C. BEAM, Melvin, O.
W. P. BEINHORN, Minneapolis, Minn.
H. E. BILLMAN, St. Louis, Mo.
L. J. BOXLEY, Roanoke, Va.
HAROLD R. BROWNSON, Malden, Mass.
J. REID CALLANAN, So. Bethlehem, N. Y.
A. R. COUCHMAN, New York, N. Y.
C. N. DOOLITTLE, Hamilton, Ont.
F. O. EARNSHAW, Youngstown, O.
ARTHUR F. EGGLESTON, Meriden, Conn.
OTHO M. GRAVES, Easton, Pa.
A. ACTON HALL, Piqua, O.
GEO. HAMMERSCHMIDT, Elmhurst, Ill.
T. WARD HAVELY, Lexington, Ky.
J. L. HEIMLICH, Le Roy, N. Y.
R. P. IMMEL, Knoxville, Tenn.
E. J. KRAUSE, St. Louis, Mo.
J. D. LANE, Henderson, N. C.
PAUL N. NAUMAN, Dubuque, Ia.
H. E. RAINER, Buffalo, N. Y.
RUSSELL RAREY, Columbus, O.
JOHN RICE, Easton, Pa.
H. E. RODES, Nashville, Tenn.
DAN SANBORN, Kankakee, Ill.
JAMES SAVAGE, Buffalo, N. Y.
F. W. SCHMIDT, JR., Morristown, N. J.
O. M. STULL, Rocky Point, Va.
STIRLING TOMPKINS, New York, N. Y.
W. H. WALLACE, Bay Port, Mich.
T. I. WESTON, Columbia, S. C.
HAROLD WILLIAMS, Boston, Mass.
W. F. WISE, Dallas, Tex.
A. L. WORTHEN, New Haven, Conn.

(*Manufacturers Division*)
L. S. SHUGG, General Electric Co., Schenectady, N. Y.

ROY WILLS, Lima Locomotive Works, Lima, O.
FRED BRAUN, W. S. Tyler Co., Cleveland, O.

BUSINESS CONDITIONS AND OUTLOOK IN CRUSHED-STONE INDUSTRY

(Summarized from reports of regional vice-presidents of National Crushed Stone Association to St. Louis convention, January 22, 1940.)

Region	1939 Business						1940 Outlook	
	Compared with 1938	Plant Operation (% of capacity)	Prices Compared with 1938	Distribution of Sales			Volume Compared with 1939	Prices Compared with 1939
				Roads	R.R.	Others		
Eastern:								
Mass.	10% down	60%	(1)	80%	15%	5%	10-25% down	(1)
Conn.	(1)	60%	(1)	81%	14%	5%	same as 1939	(1)
N.Y. (Eastern)	20% up	60%	better	(1)	(1)	(1)	fair	(1)
N.Y. (Western)	33% down	60%	same	30%	5%	65%	better	(1)
Penn. (Eastern)	same	50%	good	90%	5%	5%	up	(1)
Penn. (Western)	33% down	60%	(1)	78%	10%	12%	better	(1)
N.J.	(6)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Central	10% up	(1)	(1)	67%	8%	25%	little change	(1)
Southwestern	same	(1)	same	(1)	(1)	(1)	same	same
Northern	10% down	60%	same	80%	(1)	20%	same	(1)
Midwestern	up	(1)	down	40%	20%	40%	up	up
Southwestern	same	25%	10% down	70%	15%	15%	same	(1)
Northwestern	same	(1)	same	70%	15%	15%	up	(1)
Western	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] Not reported.
[2] Little highway work expected.
[3] Less diversion of motor-vehicle taxes expected.
[4] Chemical and metallurgical industries 61%.
[5] 1940 will be best year in decade.
[6] Producers complain of unfairness of competition between interstate and intrastate producers under wages-and-hours act.
[7] Chemical and metallurgical industries 11%.

with public works and unifying the public-works programs of the country and the Reorganization Act of 1939 which consolidated the five principal works agencies on the Federal side. He also mentioned the three new agencies which grew out of this act—the Federal Security Agency, which identifies the various activities of the government in the security field; the Federal Loan Agency, which has the Reconstruction Finance Corporation as a base; and the Federal Works Agency, which is a bringing together of the Works Projects Administration, Public Works Administration, the U. S. Housing Authority, Public Roads Administration and the Public Buildings Administration.

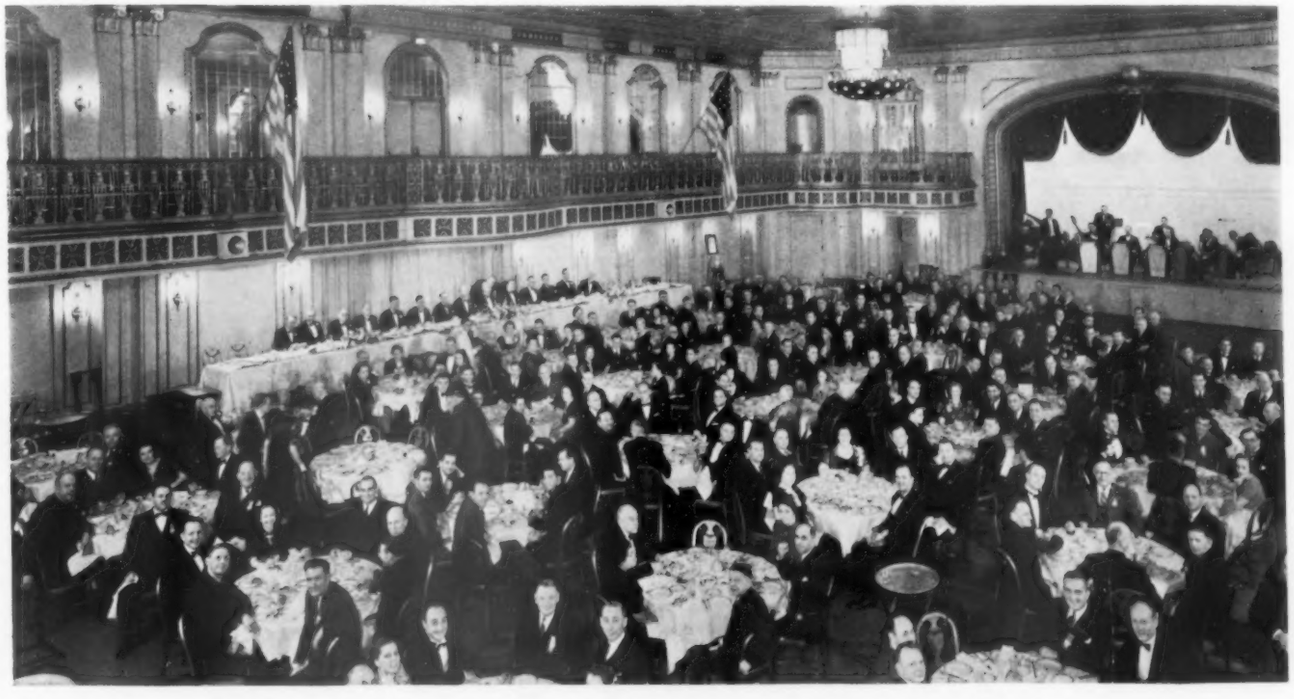
Mr. Edy then commented on the tapering off of Federal construction which was recently suggested in a budget message due to the considerable measure of recovery in general business including private construction. The P.W.A. is drawing its program to a close and will have no more money to allot unless the Congress takes some further action. The W.P.A. appropriations have also been cut.

"On the Public Roads Administration (that is the Federal highways, the secondary-road and grade-crossing elimination project) for 1941 the recommendation is to permit roads to spend about $172,000,000 as against the spending of $182,000,000 this year; in other words, a reduction of only $10,000,000 there. This amount will mean substantially the same progress in road development as occurred during the past fiscal year. . . .

"The U. S. Housing Authority is operating under an authorization to use up to $800,300,000 for low-rent housing. The job of the authority, that is the U. S. H. A., is to provide mass housing, slum clearance of a kind that apparently private capital has not been able to do with profit. There are 64,600 separate dwelling units involved in their program. There are 163 projects which are actually under construction.

"In public buildings—post offices, court-houses and the like inside and outside the District of Columbia—the actual expenditures for construction in 1941 will be only about $4,000,000 less than this current year, despite a very sharp reduction, as I have indicated, in the general public-works program. Such is the status of the Federal Works Agency programs at the present time."

"The Administrator feels very definitely," he added, "that, in addition to the program of works which may be permitted by the Congress, in addition to the unification and the general top-side supervision and management of all five of these constituent units, each identified with a different kind of works bringing them all together under in-



The annual banquet in the Gold Room of the Jefferson Hotel was, as always, one of the high-lights of the convention.

Left to right: Walter Colbourn, J. H. Fulkerson and W. F. Colclough, Cross Engineering Corp.; R. W. Cunningham, Canada Crushed Stone Co., Hamilton, Ont.

Left to right: G. D. Fraunfelder, Easton Car & Constr. Co.; A. L. Cassese, Old Colony Crushed Stone Co., Weymouth, Mass.; Ted C. Cooke, Lynn Sand & Stone Co., Swampscott, Mass.

tegrated supervision exactly as the departments of your business are supervised, the Federal government ought to make a contribution in the direction of proving that long-time look-ahead in planning public improvements for local governments, with the coöperation of the Federal government, if that is permitted by the Congress, ought to be a part of our responsibility. . . .

Elmer C. Lawton, Assistant Commissioner of Highways, New York State Department of Public Works, spoke next on *New York State Experience with Federal Class H Cold Asphaltic Concrete Pavement.* He said this type of pavement has been widely used by the state for many years and is identified as Top Course Bituminous Macadam-Mixing Method 3. It is considered to be a wearing course, generally from 2 to 2½ inches thick, and as such has little or no beam strength. The most essential properties of such a wearing course he lists as follows:

"It seems desirable to point out an analogy between this pavement and a cement concrete pavement. Each may have a stone aggregate, but the latter is held together by Portland cement sand mortar, and the former by the mechanical interlocking of stone, and adhesion of the asphaltic cement. To obtain, therefore, the essential properties above mentioned, it is obvious that the stone and asphalt must be of a proper quality; they must be combined in proper amounts, in a proper sequence, and, under refined methods of control. The mixed material must then be deposited under proper construction methods to insure uniformly acceptable results. These operations require complete coördination and control under all circumstances to secure quality.

"While many of us are not laboratory technicians, I think that manufacturers, contractors, and engineers agree that the moment the amount of bituminous material exceeds the voids in the stone in any asphaltic mix by only the slightest margin there will result fat spots or bleeding in summer and a slippery pavement in winter. The former is very objectionable, and the latter is an almost total defect in northern climates. We first learned this lesson many years ago, and nothing has since occurred to change this conception. I repeat the admonition now to explain that in our mix we deliberately design on the lean side. As time has passed we have increased minuteness of control over the mix to a point where we now stipulate certain minimum requirements in a mixing plant, and in the process of mixing. Even with these refinements there are certain manufacturing tolerances that are difficult to overcome. Hence, our adherence to the lean mix."

Mr. Lawton then described the nine common sizes of stone, gravel and slag used by his state which range from 4-inch maximum down to Number 80 sieve and are designated from Number 5 down to screenings, and the various requirements are tests imposed to insure the best possible aggregates. He also described in detail the methods and devices to be used in testing, the limitations on the final mixes, the bitumens and liquefiers permitted, the type of bituminous mixing plant and equipment approved, etc. He also described in detail the present and past mixes approved by the state, the manner of mixing, methods of hauling, placing and finishing cold asphaltic pavements and the many other factors entering into its production and use.

Left to right: Paul M. Nauman, Dubuque Stone Products Co., Dubuque, Ia.; A. L. Worthen, New Haven Trap Rock Co., New Haven, Conn.; Otho M. Graves, General Crushed Stone Co., Easton, Pa.; S. A. Phillips, Pit and Quarry; Giani Pasquale, Columbia Quarry Co., Columbia, Ill.

Highway Experience with Crushed Stone in Ohio was the subject discussed by R. R. Litehiser, chief engineer, Bureau of Tests, Department of Highways, Columbus, Ohio. The speaker first commented on some of the points in Mr. Goldbeck's report. He then outlined the character and extent of the vast stone deposits suitable for crushed stone which exist in Ohio, and commented on the extent to which deposits in different parts of the state had been utilized.

Mr. Litehiser then briefly reviewed the part crushed stone has played in the development of bituminous concrete in Ohio. In 1917, he said, less than 1,000 tons was used, but this has increased to about 737,000 tons in 1939. He described the principle surface types of the past and those now in use.

Mr. Litehiser then went into detail on the types of mixes now used for various purposes and illustrated them with slides. He described some of the modern construction methods and plant equipment which make it possible for present-day plants to produce 80 to 100 tons of bituminous concrete daily. He pointed out the necessity for rigid control of the raw materials used, especially in the preventing the segregation of aggregates which alone can materially reduce the output of a plant. Producers can build up sales advantages for themselves, he asserted, by the care they exercise, not only in the initial sizing, but in subsequent handling and stocking.

Mr. Litehiser then discussed the important part played by crushed stone in the state's Portland cement concrete program. He showed slides illustrating experience with the three aggregates, sand and gravel, crushed stone and slag, specified by the state, to show their comparative compressive strengths, transverse strength, beam strength, etc.

Mr. Litehiser then referred to his talk on specifications for stone sand at a previous convention and gave some later information including compressive strengths of cores from concrete pavement made from stone sand. These compared favorably with cores from concrete in which natural sand was used.

The Los Angeles abrasion test next came in for attention and in the speaker's opinion this test is more promising than the sodium-sulphate or magnesium-sulphate tests and does not have the deficiencies of the Deval abrasion test. He also compared the results of the modified abrasion test, used by the state for many years, with the Los Angeles tests and gave the conversion factor used in making such comparisons.

Speaking of soundness tests, Mr. Litehiser said that these are now used only as a guide in selecting aggregate and the service record of the concrete in which the particular aggregate has been used is also taken into consideration.

The freezing-and-thawing test, he said, may prove more satisfactory inasmuch as it employs directly the same factors which are at work in nature in deteriorating any structural body in which they can gain a foothold. Mr. Litehiser closed by showing a few photographs of some of the bridges recently built in Ohio.

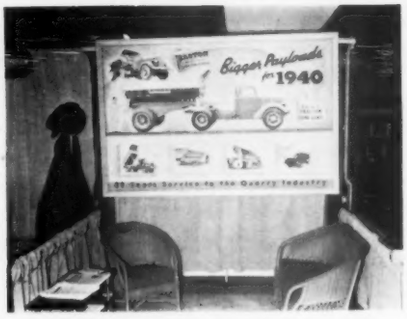
Next on the program was a talk by Dawes E. Brisbine, research counsel, National Highway Users' Conference, Washington, who spoke on *Meeting the Problem of Diversion of Highway Funds*. The speaker first reviewed the history of transportation and said that the roads existing before railroads were ever built fell into disuse and were used mainly for local transportation for many years after the railroads had been built. Then the automobile came along and reversed the trend and revived road building. He outlined the benefits highways have brought us.

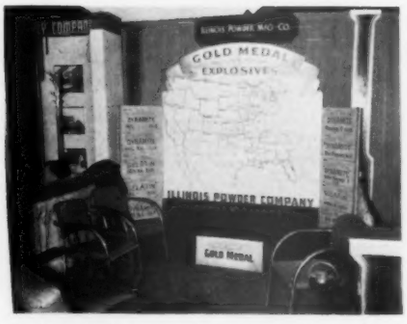
According to Mr. Brisbine, local taxes were used to defray all highway costs until about 25 years ago. In 1901 New York passed a vehicle registration law with an accompanying fee and the other states quickly followed this example. In 1938 state vehicle registration fees totaled $405,000,000. In 1919 Oregon passed a gasoline tax, which other states quickly imitated, and the income in 1938 from this form of taxation amounted to $767,000,000. The Federal gasoline tax in that year amounted to $285,000,000, making a total automobile taxation in 1938 of

Aubrey Smith, General Electric Co., doing tricks for Nelson Severinghaus, Consolidated Quarries Corp., Lithonia, Ga.; and A. W. McThenia, Acme Limestone Co., Alderson, W. Va.

Left to right: W. W. King and Fred Braun, W. S. Tyler Co., Cleveland; Bruce S. Campbell, Harry T. Campbell Sons Co., Towson, Md.; W. L. Blackwell and R. A. Hemphill, Weston & Brooker Co., Columbia, S. C.

CRUSHED-STONE CONVENTION EXHIBITS





Reading down, left column: American Cyanamid & Chemical Corp., American Manganese Steel Corp., Atlas Powder Co., Brooks Equipment & Mfg. Co., Bucyrus-Erie Co. Center column: E. I. Du Pont De Nemours & Co., Easton Car & Construction Co., Frog, Switch & Mfg. Co., Hercules Powder Co., Illinois Powder Mfg. Co. Right column: Link-Belt Co., Marion Steam Shovel Co., Northern Blower Co., Pettibone Mulliken Co., Williams Patent Crusher & Pulverizer Co.

Left to right: F. H. Edwards, New Haven Trap Rock Co., Meriden, Conn.; Geo. E. Schaefer and C. A. Reid, General Crushed Stone Co., Easton, Pa.; J. C. Farrell, Easton Car & Construction Co.

$1,700,000,000. Of that amount, said Mr. Brisbine, about 1¼ millions was supposed to go direct to highway use.

The diversion of highway funds did not really become a menace until the depression years. Measures are now being taken in many states to check this practice, according to Mr. Brisbine. The states of Kansas, Minnesota and Missouri had constitutional amendments prohibiting such diversion and Colorado, California and Michigan recently followed suit. Several other states will vote on such amendments this year and others are giving the matter serious consideration.

Mr. Brisbine said that the diversions of highway funds in 1937 totaled $198,000,000, enough to build three transcontinental highways of a high type. Diversions by counties and cities he estimated to total about two millions. The state of New York diverted more money in proportion than any other. Diversion is especially unfair to the driver who covers the greatest mileage yearly as he thus pays far more than his share of general governmental expenses as well as of highway expenses. Putting it in another way the motorist pays for, but does not receive, safe and adequate highways. According to Mr. Brisbine, 300,000 men could have been employed for a year by the money diverted last year.

S. C. Hadden, executive secretary, Indiana Mineral Aggregates Association, Indianapolis, described an organization being formed in the state of Indiana primarily to combat diversion. This is called the Indiana Automobile Taxpayers' League and, unlike most others, this is strictly an automobilists' league, not real estate. Mr. Hadden reviewed the history of highways, taxes and diversion in his state and the total diverted to date he said totals about 11½ millions of dollars, about 5 per cent. of the total collections.

Mr. Hadden then read a constitutional amendment proposed and approved by the governor several years ago which was incorporated in both the Democratic and Republican platforms. Written in this amendment was a provision to give the state control over money given to counties, cities, etc. This provision was what finally defeated the bill. This, according to Mr. Hadden, was one of many experiences which have led up to the formation of the organization. Both the chairman and the vice-chairman of this body are experienced highway and business men, one being a Republican and the other a Democrat. There are three types of memberships; sustaining, active and associate, with dues respectively of $100 up, $5 and 50 cents. Only the active members have voting privileges. Mr. Hadden said it was the hope of this body that it would in time reduce the amount of diversion and eventually force amendment of the constitution.

The Tuesday morning session was presided over by J. A. Rigg, Acme Limestone Company, Alderson, West Virginia. The first speaker was G. M. Wright, development department, Goodyear Tire & Rubber Company, Akron, whose subject was: *Pneumatic Tires—Their Use and Care in Quarry Service.* Mr. Wright said that since his visit to last year's convention he had inspected quarries in many states to study the application of pneumatic tires to quarry haulage units. He reviewed the history of the automotive industry and the fact that solid tires were used to a large extent until the pneumatic tire really came into its own about 1927. It was not, however, until the construction of Boulder Dam that penumatic tires were used for heavy-duty, slow-moving vehicles. Since then, said Mr. Wright, they have entered practically every other field and are now finding general use in all kinds and types of operations.

Mr. Wright then gave a very interesting description of what a tire is and what it is designed and called upon to do.

"Since the highway truck tire was first developed, it is only natural that the stress factor employed in arriving at its proper load rating should be used as a basis for calculation.

"We have therefore arrived at four separate load tables to meet four different general conditions of service. These are: 1. The basic truck and bus table for high speed over improved highways. 2. What we term 'off-the-road' service at 10 miles an hour, for such operation as earth moving, quarrying, mining, logging, excavating. 3. This same type of 'off-the-road' service but at 25 miles an hour. 4. Twenty-

Left to right: J. D. Lane, Raleigh Granite Co., Henderson, N. C.; Bruce Campbell, Harry T. Campbell Sons Co.; J. M. Thistlewaite, Nordberg Mfg. Co.; M. A. Eiben, Northern Blower Co.; D. A. Cheyette, Nordberg Mfg. Co.

five miles an hour over improved or semi-improved roads, such as you generally find or at least should find in strip mining and quarrying.

"To impose a greater load than the maximum recommended for a particular size of tire usually results in decreasing the mileage life, which means increased mileage costs.

"As to the matter of overload, it has been pretty well established for general service that if you overload your tire 10 per cent. and a continuous run is made, I mean through the life of the tire, you operate at 10 per cent. overload, you may expect a decrease of 18 per cent. in the life of the tire. If that is boosted to 30 per cent., you may expect a decrease or a loss of 43 per cent.. . . .

"The woods are full of different tread designs. You have a variety from which to choose, but, when making your choice, keep these things in mind. Specially designed tires are made for operating in rock, mud and dirt, high-speed highway transportation, and other specialized services. Make your selection from those designed for your particular needs. If hauling blasted rock from a shovel to the crusher, choose the design which will best withstand cutting and chipping and offer greater resistance to road shock. Such tires have massive tread elements and unusually thick tread and side-wall rubber.

"Do not choose a wide-open design. The heavy tread blocks help distribute road shock. In a wide-open design, fair-sized pieces of rock get between these blocks and cause tire injury.

"Avoid designs having the elements of the tread so closely spaced that small chips or sharp stones will be picked up. Regardless of how good a haulage road you maintain, there are always chips and small stones lying on the surface which, if picked up and held by the tread design, may easily cut their way into the body of the tire. If hauling soft, chalky rock, and your quarry floor is such that cutting, chipping and road hazards are nil, but traction is a basic requirement, choose a tire especially designed to give traction.

Abe Goldberg, Allis-Chalmers Mfg. Co., right, explaining things to A. G. Seitz, General Crushed Stone Co., Easton, Pa., and James Savage, Buffalo Crushed Stone Corp., Buffalo, N. Y.

"On drive wheels and on trailing wheels equipped with brakes, avoid designs which contain unbroken, circumferential grooves. Such designs reduce traction, and a spinning tire of this type will cut easily, especially at the bottom of grooves. A broken-up design increases traction and, in addition, tends to eject pieces of stone that might otherwise ride along and cause damage. . . .

"No single item will run tire costs higher, more quickly, than incorrect air pressures. Correct air pressure is to the tire what correct oil pressure is to the engine. Too much pressure means excessive cord stress, and ordinary impact loads may cause failure of over-inflated tires. Over-inflation also stretches the tread and side wall rubber, making them more susceptible to cutting. . . .

"Too little pressure causes excessive flexing at localized points, and failure or fatigue results—that is fatigue to the cords in the tire. It may also cause slippage of the tire on the rim or damage by crushing the tire against the rim.

"Inspect your tires regularly. Pick out all foreign materials. Repair snags and cuts before they develop to a point requiring major repair. Put new replacement tires on drive wheels and, if possible, run the older tires on the trail wheels. Keep your haulage roads in good condition. Make refills, use graders, clean up around the shovel. In large operations, have a man patrolling the road at all times. He will pay for himself in fewer tire repairs and fewer delays. . . .

"Make regular checks on front-wheel alinement, bent axles, sprung frames, shifted or broken springs, and so forth, to avoid fast scuffing wear from misalinement. Do not mount tires as duals if there is a difference of more than one-quarter of an inch in their diameter. The larger of the two tires should go in the same position as the larger of the two old tires. For instance, if the original tires show that the outside tire wore down faster than the inside tire, the new one should be mounted with the larger of the two on the inside. Dual tires should have the correct spacing to prevent rubbing or kissing. When one side wall has been badly scuffed, the tire should be turned around so the other side wall can take its share of the scuffing before the tire finally goes out of service. Oftentimes

Left to right: E. V. Acton and C. A. Hurt, Rock Hill Stone and Gravel Co., St. Louis; F. B. Ungar and John E. Steffen, Ludlow-Saylor Wire Co.; C. L. Power, Rock Hill Stone & Gravel Co., St. Louis.

In this group are J. H. McKerman and W. F. Quinn, New Haven Trap Rock Co.; M. E. McLean and B. L. Prater, East St. Louis Stone Co.; H. E. Rainer, Federal Crushed Stone Co., Buffalo, N. Y.

tires have gone out of service with one side wall full of cuts and slashes, while the other side is scarcely nicked. . . .

"All rims should be cleaned before applying tires, so that they will be free from rust. Do not use any kind of oil or grease on the rim or the bead of the tire. It is a very common practice. It is pretty hard to change some of these big tires, and you will find a garageman putting a little grease or something on the bead of the tire and on the rim so it will slip on easily. . . .

"Mounting and dismounting tires is dangerous business. When dismounting, be sure all the air is out of the tube before the side rings are taken off. To be absolutely sure of this, it is best to let the air out of the tube before removing the wheel from a truck.

"When mounting, be sure the complete rim is assembled correctly, before starting to inflate. As an added precaution to this, it is good to stand the tire with the loose side ring of the rim next to a post or a wall or some other stationary object. Then if it so happens that the man does not have the locking ring in place and inflation blows it off, he is not going to get hurt. Some very bad accidents have happened by disregarding that little thought. . . ."

The next paper *Quarry Haulage,* presented by Stirling Tomkins, New York Trap Rock Corporation, New York, described his company's experiences with truck haulage. Moving pictures were shown to illustrate the manner in which all the hauling in the company's four quarries is now being done with truck tractors and Easton semi-trailers. Especially interesting was the fact that in one quarry these units replaced a remote-controlled electric haulage system, in another they replaced steam locomotives and cars, and in the other two they replaced trucks. In all cases the new equipment lowered hauling costs and increased the output of the loading equipment and of the plants. Many interesting facts were brought out by Mr. Tomkins and his talk aroused much interested discussion. However, because much of this information was published in an article in the October, 1939, issue of PIT AND QUARRY, page 34, readers are referred to it for more details.

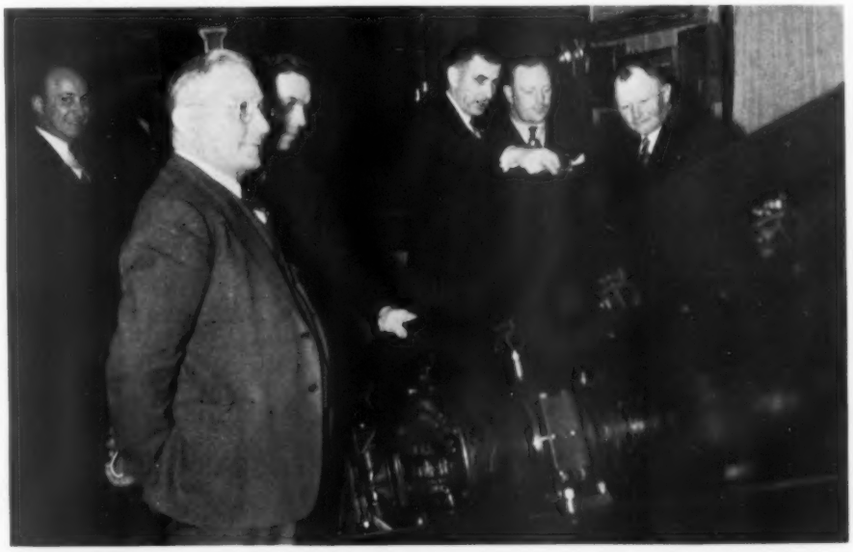
In the discussion following this paper Bruce Campbell, Harry T. Campbell Sons Company, Towson, Maryland, said that his company is using trucks to haul up grades as steep as 11 per cent. but that when doing so they haul only 9 instead of the usual 14 tons. Mr. Tomkins stated that the haulage units used by his firms are averaging 3.4 miles per gallon of gasoline.

A. T. Goldbeck, engineering director of the association, next spoke on *Why Cubical Stone?* He stressed the importance of the shape of crushed-stone particles on the strength, workability and other characteristics of concrete. Those producers afflicted with this problem were advised that the lower the ratio of reduction in crushing, the higher the percentage of cubical product. In the discussion following his talk it was brought out that a 4 to 1 ratio of reduction was found to be the most economical when both the product and the cost of making it are taken into consideration. It was also asserted by some of the producers present that a crusher kept operating at full load will produce a higher percentage of cubical material than one which is only partly loaded.

Dr. E. E. De Turk, professor of soil fertility, University of Illinois, opened the Wednesday morning session by telling his listeners what kind of limestone farmers need. He told them first what happens when limestone is placed in the soil.

"What happens when we lime a soil? We see that acid clay in the soil that needs liming is one of the very important things that is concerned, and we put limestone on the soil. First of all, it must dissolve. It dissolves in the carbonic acid that is produced in the soil by decaying vegetation, some brought down in the rain. Carbon dioxide gets into the soil water, and we have carbonic acid which dissolves the limestone. Then the calcium, being soluble, next starts to diffuse. . . .

"After putting limestone in the soil the calcium immediately starts to move out. All the soluble material diffuses. It wants to spread out in a region where it is less concentrated, just as salt in a glass of water tends to diffuse through



In this group M. W. Steffener, F. W. Kremmel, E. A. Heise and August Heise of the Columbia Quarry Co. are having something explained to them by R. C. Johnson, Simplicity Engineering Co.

the water as soon as it is dissolved. The calcium starts moving out through the particles, and it doesn't go very far until it hits a particle of clay. It is caught there. It is definitely held by an electrostatic force. The lime is definitely bound to that clay particle by this electrostatic force. So that, as soon as the calcium comes to a particle of electronegative, or acid, clay it is caught there and held there, so that immediately the particle is surrounded by a film of neutral soil. Most of its dissolving, therefore, takes place in neutral soil because the lime in the soil is not stirred.

"What does it take to make good quality? There are just two factors. One of those is chemical purity. There is no use to worry about how finely it is ground, if it hasn't any calcium carbonate in it, because, if it is a low-grade limestone, you can grind it as fine as you want to, and you can't get any higher quality, any higher neutralizing value. It has to neutralize that acid soil.

"Assuming the chemical quality is good, and most of the limestone that is ground is of good chemical quality, 90 per cent. or better, the other factor is the fineness to which it is ground.

"If we are going to have the limestone do its job, we must have enough particles scattered through the soil so that each particle doesn't have too much territory to cover in the work of neutralizing the soil. . . . Assuming that all the limestone particles were cubes, in order to make it easy figuring, if we start with 100-mesh limestone, the volume of soil that each particle has to neutralize is so small, we can't show it on a chart until we get down to 28-mesh. We find with 28-mesh limestone that each particle has about ⅛ of a cubic inch to take care of. With 14-mesh limestone each particle has about ¼ cubic inch to take care of. With 8-mesh limestone we find that each particle has about .8 of a cubic inch to take care of. When we jump from that to 4-mesh limestone we find each particle has to take care of 6 cubic inches of soil. If we go from 4-mesh to 3-mesh, which is a ¼-inch particle, each particle has to take care of 15 cubic inches of soil. We will see that it isn't hard to draw a dividing line between what is comparatively high grade limestone and comparatively low. The line is between the 8- and 4-mesh sizes. We in Illinois felt that some method of scoring or evaluating limestone should be developed so that we could say specifically, 'This limestone has a certain value and this limestone has a certain higher or lower value, and that value should be based upon the screen test.'

"Everything above the 8-mesh we gave a high value, 80 per cent. or better. Everything below that we gave a low value. We feel the function of this score card is primarily to enable us to assess dockage on coarse material and not to split hairs on good material. . . .

"After ten years of using that scheme, we have found that it has given us more and more confidence in its usefulness in evaluating limestones on the basis of fineness. It doesn't bar the man who doesn't get all his limestone through an 8-mesh sieve or 10-mesh sieve. The man whose limestone has some coarser than that still has a chance to get credit for the fine material that is in it. . . .

"The score card rating has gone up in ten to fifteen years from a rating of 75 to a rating of 86, as to all the limestone in the state, and we are checking on about 150 sources. It has improved the quality of our limestone. I think it has done it without harming the producers and without causing any friction. They have been willing to go halfway or more than halfway in trying to improve matters. We have not gone as far as we want. I think we should get that score up to about 90 before we quit, and I don't think we should go above a score of 90 by this score card method. . . .

Ralph Hunt, Screen Equipment Co.; A. J. Hooker, Buffalo Crushed Stone Corp., Buffalo; Harvey N. Clark, Dolomite Products Co., Inc., Rochester; C. S. Fielding, Screen Equipment Co.

In the absence of Major A. B. McMullen, chief, airport section, Civil Aeronautics Authority, Washington, his paper, *Expanding Our Airport Facilities,* was read by F. H. Grenue. He discussed the prospects of the inauguration of an airports program, to which the Federal government would contribute $125,000,000 this year. He pointed to the need for adequate legislation to make the program a reality. He also discussed the problem of financing airport construction.

Price Control by Government was the subject of an address by Edwin B. Grough, associate editor of *Dun's Review.* He said in part:

"Specifically, policies can range from outright governmental monopoly to the complete unawareness or, at any rate, a lack of belief that some particular action thought desirable by somebody is going to have any effect on price at all. Oddly enough, it happens there are a great many of the patches in this crazy quilt that do have a sufficient similarity of texture to permit a rough classification. A common way of arranging them is as follows:

"(1) the pricing of government's own services, as in the case of the mails, the most familiar of that is the postal savings, and fees and licenses and the sale of its own publications, and a lot of details of that sort.

"(2) price fixing, as in the case of the railroads, and more recently of coal;

"(3) efforts to fix the plane of competition by the prohibition of certain types of practices that have grown up in business, and, beyond that, letting prices lie at the disposal of competition as thus limited.

"Despite diversity of practice, most of the current excitement over the government's intervention in price-making arises out of its passion for making prices serve their traditional purpose of stimulating maximum use of our national resources. Its spokesmen pound incessantly on the theme that price is the link, and the only substantial link, by which a commodity is bound to other commodities in the common competitive system. The principle of price making by competition in a free and open market is deeply imbedded in common law, the anti-trust acts, public policy and the mass mind. Perhaps above all others, it lies at the heart of our capitalistic system. It is hard to override it without arousing resentment. Such being the case, the gods must be at least gently amused at the spectacle

we present of business and government mutually accusing the other of violating so sacred a creed. For both of them are right, and neither can help itself completely, which paradox does no more than raise the question of the degree to which we are merely supplying corrective touches to our favorite system or tending to discard it.

"In particular a great hue and cry has been raised about so-called rigid prices. These are prices that remain relatively firm or actually rise through all kinds of business weather, in counter-distinction to those that fall out of bed at light touches of advertising. The principal ground of resentment here is that where prices are rigid, something else has to give, and it usually turns out to be production and employment, and our national standard of living. Theodore Kreps pointed out in his recent study of price problems for the book recently edited by Willard Thorp on *Economic Problems in a Changing World* that in the area of wholesale prices, by value nearly 40 per cent. of the articles examined were offered at prices that were quite or relatively indifferent to changing market conditions. The reasons for this independence are many, and it is in itself a major task to classify them even so broadly as to natural and artificial categories. At any rate, disregarding the question of moral or economic responsibility, at the one extreme prices are the children of nature, while at the other they bear the plain imprint of a man-made economy. Meanwhile, behind all these scenes, the courts, the Congress, the state legislatures, the trade associations, the labor unions, the economic associations, the prosecuting agencies, the relief organizations and the church sociables, for that matter, may be trying to get you to do something about your prices and, in some cases, obliging you to do it. . . .

"To meet the issue squarely, when the administration puts restrictions on private activity or tries to lift some of those that business has put on itself, it is all done in the belief that our system has become so artificial, structurally, that only by both kinds of action can any kind of equilibrium be restored. When farm acreage is curtailed and pigs are plowed under by the Soil Conservation Program, the idea is that industrial output is so paralyzed by tariffs and rigid prices, monopoly, collusion, price leadership, and similar devices, that agricultural buying power must be raised by hook or by crook. The idea is that the plane of commodity exchange by which we live has to be kept level. Goods can't move freely if they have to keep climbing up and down higgledy-piggledy price steps to make any contact at all. That is also the official philosophy lying behind the incessant drives on utility rates and on the prices of durable goods. For decades, although most pronounced in recent years, that has been the theory underlying the anti-trust laws. One of the most daring applications of those laws that has ever been attempted is in Mr. Arnold's present swoop on the construction industry with a net calculated to catch erring manufacturers, distributors, retailers, contractors and unions in one all but incredible embrace. The strands of this net are widely spaced and the population in this industry is of the teeming variety. Nevertheless, believes Mr. Arnold, the mere evidence of intention and of a will to carry it through will create an atmosphere in which uneconomic practices can no longer flourish. The necessary corollary to this theory is that most of the restraints on the construction industry are disliked by most of the members of the industry itself, that all they need is a show of support against what has been an effective minority. You might almost say that here again what is involved is a flat plane of pressure, on which any single prosecution is a point of impingement driving the whole plane downward. This is exciting and dangerous business, but it must not be interpreted apart from the administration's basic idea that without free and easily moving prices there can be no sustained prosperity. Indeed many of the moves necessary to effectuate such a policy would have to be harsh, for the theory is pat and simple, while business is complex and eccentric. For a long time, perhaps always, it will remain an open question as to the extent to which schemes can overcome facts. When the capitalistic system began to take form, with its corollary of free competition, it would probably have happened if Adam Smith had never been born. Perhaps the most that reformers expect themselves is some cushioning of the extremes in highly flexible prices as in agriculture, and at least a visible relaxation of those that for many good and bad reasons tend to become set or sluggish, as in heavy goods. It is probable that any extensive adjustment in the direction sought could be achieved only at the expense of a violent shaking up of our general system as well as of men's minds.

James W. Irwin, assistant to the president, Monsanto Chemical Company, St. Louis, spoke on *Getting the Workman's Point of View*, but permission to publish his remarks has been withheld.

The Determination of Prevailing Minimum Wages for the Crushed-Stone Industry under The Walsh-Healey Act was discussed by L. Metcalfe Walling, administrator, Government Contracts Division, U. S. Department of Labor. In speaking of the origin of the act, he said:

"Contrary to a good deal of popular belief, the Walsh-Healey Act was not put on the statute books very hastily as the N.R.A. was. When the N.R.A. was declared unconstitutional, there was a period of more than a year when there was hot and heavy debate in Congress and in the country as to what, if any, substitute should be put in its place.

As a result of that debate, it was decided that the government could and should appropriately use its purchasing power to influence labor standards. It was pointed out that it was very anomalous for the government, on the one hand, to be constantly urging private industry to maintain good labor standards and increase existing labor standards and, on the other hand, do all that it could, by its vast purchasing power, to subsidize the elements in industry which were making it difficult, if not impossible, for those standards to be maintained—by subsidizing the most unfair kind of cut-throat competition in labor costs of all kinds. So, the Congress adopted this statute which applies to all companies dealing with the Federal Government in the manufacturing field, with certain exceptions which we need not concern ourselves with here, in amounts over $10,000.

"Now, the importance of that may be gauged by the fact that we have had to date about 20,000 such contracts in about three years of time, totaling about $1,600,000,000, and that almost every American industry at some time or other has been affected by the act. If we say, roughly, that 8,000,000 people are employed in manufacturing industries, in the narrow sense, excluding transportation and other types of industrial operation, probably 20 to 25 per cent. of that total has been affected directly or indirectly by the provisions of the act. We now have in force nearly forty minimum wage determinations which affect industries employing about 2,000,000 people. . . .

"You have had something over $8,000,000 worth of government business subject to the Walsh-Healey Act in three years' time, not counting about 156 so-called indefinite contracts, the exact amount of which we do not know, but which would raise that probably by a considerable amount. You might be interested, also, to know what your record of compliance is because it compares pretty favorably with other industries.

"I had a special report made for me before I left, for my own information as well as yours. You have had awarded 197 contracts up to January 15, which were filled by 81 different companies, either as the direct contractor or as a

source of supply to some other bidder. Of these 81, we have investigated 60 different companies and found 23 to have been in some kind of monetary violation; that is involving either a child-labor penalty, which I think was not found in any case in this industry, or a failure to pay overtime in accordance with the provisions of the statute. Those restitutions which have already been made amount to $26,437, which is a small fraction of the $300,000-odd that have been found due to employees, so far, for all industries. . . .

"As a result of the decision of your Board of Directors last summer, to which I referred earlier, a wage survey has been made of the industry, and, as a result of conferences with the sand and gravel and the slag industries, similar surveys have also been made. It seems to be the desire of those three industries to have simultaneous considerations as was done under the provisions of your code, in view of the similar conditions and, again, in view of the highly competitive situation between all of these industries. So that decision has been arrived at, I think, with the unanimous support of all concerned. . . .

"In general, in an industry where there is a highly differentiated group of common labor set off from the other occupations in the industry, as we had in the cement industry, for instance, where about 20 per cent. of the employees were common laborers, the prevailing minimum wage is the wage which affects those employees. In other industries where there isn't this clearly defined demarcation between common labor and other occupational groups, some other lower occupational groups may be considered along with common labor. We, of course, are interested in the lower paid workers as distinguished from the higher paid workers or those of medium skill. We usually attempt to define clearly the occupations which we are considering in connection with a particular minimum wage. . . .

Mr. Walling said that a hearing for determining prevailing minimum wage rates would be arranged at a time convenient to a majority of the industry.

To a question whether the wage rate fixed upon as the prevailing minimum figure would apply to all types of labor, Mr. Walling replied that it would be one wage for the entire industry. No occupational wages are found. There may, however, be different rates for different parts of the country.

J. A. Rigg asked about stock-piles which contain some material produced for government contracts and some for commercial contracts and wanted to know whether the use of part of that stock for agricultural limestone sold to the government would involve all the processes preceding the storage. Mr. Walling said in reply:

"Our so-called stock pile rule has been specifically formulated for what I will call, in layman language, the building supply industries. I mean sand and gravel, crushed stone, slag and so forth —top soil, where we recognize that you have a problem not only of sporadic delivery but also of tracing back the identity of any particular part of the product which you are supplying to the government. So, we have ruled in these industries only, not in manufacturing industry in general where the factual situation is quite different, that you are not responsible for the labor which is expended in building up a stock-pile prior to the time you take the contract, or if you maintain constantly during the period of performance, particularly when you have sporadic deliveries, some one week and perhaps none the rest, a stock-pile always large enough to supply the government delivery at any particular moment. So that you need not, in that case, go back and identify particular employees or a particular part of the business which, of course, you never could do; it isn't possible for you to do, in most cases, unless the government demands are very large, in which case you probably would be not in the sporadic delivery situation and would be able to gage the thing. The question is one of fact as to how far back you go. The collateral sporadic delivery rule has, I think, eased the situation for your industries considerably.

"We recognize that you have not been habitually on the 40-hour week to the extent that industry has, and that sporadic delivery is almost characteristic of your contracts with the government and that, in many cases, it is the government's own fault for not enabling you to make deliveries more continuously and more constantly. Therefore, although the government itself can do nothing about it because that is the way it has to have its deliveries in order to carry on its projects, recognizing there is some element of responsibility on the part of the government, we have ruled that, where you have a sporadic delivery situation, instead of having your overtime figured from the beginning of your normal payroll period—which you yourself, as you know, are privileged to select at the beginning of your contract—you may during the period of sporadic delivery select the day on which you make one of these deliveries and figure the government jurisdiction as starting then for the next 7-day period. This enables you to control somewhat the hours of the people who have been working on government contract, not perfectly, I recognize, but at least you are not faced with the situation of having the government come along on Friday and ask for delivery when you have had no warning that such a request was going to be made, and when you may have worked a considerable amount of overtime during the week prior to Friday. In other words, you are caught without having any possibility of gaging the situation and holding your hours down to avoid the overtime payment. So, in that specific situation, you are permitted to start figuring your pay-roll period from that first delivery for the next 7-day period."

Following Mr. Walling, representative of government, came John C. Gall, who, as counsel of the National Association of Manufacturers, is a spokesman for business. On the relationship of government to business Mr. Gall said:

"When you look at the whole field of labor relations legislation in retrospect, you find that it also fits a pattern of scarcity. However, the pattern can be much better justified in the field of labor relations than it can in the field of agriculture.

"What I have in mind is this: The whole pattern of labor legislation, fitted together, has a tendency to take out of the labor market various marginal groups of workers and, by subsidizing them in one way or other, to take them out of competition, so you have left only a body of what are supposed to be active and efficient workers.

"That is definitely a policy of scarcity as applied to the labor market, in the same way that the government developed a policy of scarcity in the field of agriculture. You get it in various ways. First they cut into the labor market by prohibitions on child labor. Please don't think I am raising any reservation whatever about that principle which takes off the market, at one end, certain workers who formerly were a competitive factor in the market. Then we have extended through education laws the period during which children must stay in school. That, again, tends to take some of the pressure off the labor market.

"We have workmen's compensation laws which compensate men when they are out of work due to injury. And to the extent that a man can collect compensation, that has some tendency to take a further burden off the labor market, as far as he is concerned.

"More recently we have adopted unemployment-compensation laws which also have the tendency, by taking care of the man when he is not working, to relieve the pressure on the labor market.

"We have now a proposal to extend that principle to health insurance or to pay a man for time when he is not working due to illness. That is a far

more dangerous proposition, from the standpoint of administration, than any of those which I have mentioned, but it also is in the same direction.

"Finally you have old-age pensions which take the worker off at the other end of the line. When you look at the child-labor prohibition and the old-age pension provision at the other, you see it is all working toward a time when all you will have left is the body of active workers at their most efficient periods of life.

The Wagner Act has been criticized by employers, agricultural groups, many civic groups and others who are not employer-minded, let us say. It has been criticized as being definitely class legislation and one-sided, both in its provisions and in its applicaton. I have heard the answer to that that is made by the administrators of the National Labor Relations Act, and that is those who support the act as it stands say that criticism is unfair, that the National Labor Relations Act is not one-sided merely because it provides benefits for employees only and prohibition against employers.

"What happens in the ordinary case where the employees have selected someone to bargain for them with their employer? A man comes to the office and says to the employer or his representative, 'I have been picked by the men to bargain with you.' "It used to be, in the early days of the administration of the National Labor Relations Act, that you ran a great risk of insisting that he present credentials, and the board would do what it had a right, under the statute, to do. It might certify him on the basis of an investigation by the board and without any election, and you might just as well have accepted him at the outset, because he was likely to be certified without election.

"To-day the board is very reluctant to certify without the holding of an election. That is one of the benefits, and I think we should consider the benefits as well as the injustices. The board does not take any chance in certifying anybody without an election. If an employer has a doubt in his mind, he can sit back and say, 'You bring me a certificate from the National Labor Relations Board showing that you represent my men and I will bargain with you,' as the statute requires that can be done.

"Suppose a man does not represent a majority of the employees but does represent some of them, and he wants to bargain for those he represents, do you have to bargain? . . . There is no obligation under the statute to bargain with anybody who does not represent a majority of the employees in the unit. Most employers who have had the problem put up to them take the position that if anybody comes to them and can demonstrate that he represents any of the employees, they will talk to him and find out what grievances the workers have, what it is that he is asking for on behalf of those whom he represents.

"The only limitation on that is this: You cannot under the National Labor Relations Act enter into any arrangement for a closed shop, with a man who does not represent a majority of the employees. You must keep the door open in case later on somebody does represent a majority, in which case you have to deal exclusively with the man who represents the majority.

"Suppose you do not believe that the man who presents himself represents a majority of your employees and you say, 'No, go ahead and get an election.' Suppose the board comes to you and says, "We would like to hold an election in your plant, will you enter into a consent arrangement with us for an election?' The question is whether you should enter into a consent arrangement with the board or whether you should just simply say to them, "You have the authority to hold an election. You go ahead and hold it. I will have nothing to do with it.'

"My advice, very strongly, is that when there is an election in the offing it is far better for the employer to enter into a consent arrangement with the board and to participate in the making of the conditions under which that election is going to be held. I say that out of a number of experiences that I have had, because in the making of the consent agreement, you do not have to consent on the terms offered to you by the board. You can negotiate with them as to the conditions under which the election is to be held, as to the date when it is to be held, as to the place where it is to be held, as to having watchers at the polls and seeing that the employer and all labor groups are represented there, as to what employees are going to be permitted to vote. Often that is a very important question, particularly in small plants, because the election may turn on a handful of votes, and the question of whether certain employees are permitted to vote or excluded from voting is extremely important. I think, personally, it is wise policy in those situations to enter into a consent agreement properly worked out, with the advice of your local counsel and to hold the election under terms of cooperation rather than terms of antagonism.

Harold Williams, lawyer member of the association's board of directors made some comments on the National Labor Relations Act. He said in part:

"The National Labor Relations Act is an extremely controversial topic, an extremely one-sided topic. It is a one-sided act aimed to benefit one class at the expense of another class. We as the employers' class, the target of the act, as you might say, are naturally critical of it and disposed against it. I think it is only fair to say, however, that while it is class legislation, it is not class legislation of an essentially or necessarily objectionable character because there is a reason for discriminating in favor of a particular class in this connection.

"This is a curious statute. The more you read it, the more you realize that it is rather unique in Federal legislation, perhaps in any legislation. It is designed to recognize and protect the right of collective bargaining, and that is really all it is designed to do.

"Apparently this is the crystallization in law of a slowly growing, ethical concept that there is a right on the part of workers in a group to act as a group in dealing with the employer. That right is recognized, and it is that right which this act is aimed to protect, and that is all it is aimed to do. They don't care what kind of collective bargain you make. They don't care whether you make any collective bargain or not. They don't care whether you keep it when you make it. All they want to do is to protect the opportunity for that, and, in order to do that, they prohibit certain practices or certain activities by an employer to prevent the men from organizing in a union of their own choosing which can deal as an independent unit with the employer.

"It may be that, as time goes on a more rational, more broad-minded, liberal, intelligent interpretation and administration of the act will tend to cure some of those things, but even so there seem to be things about the act now, no matter how interpreted, which should be cleared up, and perhaps cleared up by amendment to the act . . . .

Asked what specific amendments to the act he would suggest, Mr. Gall said:

"I hesitate to go into the list of specific amendments, some of which are rather detailed and technical. Fundamentally, I could summarize our position on it this way, I think: that what we want is an act that is equalized so that it protects the employee against unfair practices, whether they are committed by the employer or by the union. That is the first thing. Secondly, when an employer is haled before a board under this act, we think that he ought to have a fair trial according to established rules of evidence before a fair tribunal and with adequate court review. That summarizes in just a few words the fundamentals of what we stand for."

Mining Engineers Ponder Problems of Economic Import at Annual Meeting

ECONOMIC problems of the nonmetals occupied a large part of the program of the Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers at the annual meeting in New York, February 12 to 15, 1940. W. M. Weigel, mineral technologist of the Missouri Pacific Railroad, was elected chairman of the division, succeeding M. M. Leighton, state geologist of Illinois. Elected to serve with Mr. Weigel as vice-chairmen were S. B. Patterson, Jr., general manager, Calcite Quarry Corporation, Lebanon, Pennsylvania; Hugh S. Spence, mining engineer, Department of Mines of Canada; and Paul M. Tyler of the U. S. Bureau of Mines. Frank H. Reed of the Illinois State Geological Survey continued as secretary-treasurer.

Economics.—A feature of the general program again this year was the all-institute session Monday afternoon devoted to broad problems of economic importance. The first speaker was Merlin H. Aylesworth, former president of the National Broadcasting Company, who asserted that American business must prove to the public the fallacies in "crack-pot schemes" aimed to destroy the capitalistic system. Private enterprise is still the dominant factor in American industry, he stated, and capitalism is not cracking despite the claims of "muddle-headed economists, political charlatans, and other members of the lunatic fringe" who have been criticising it for the last ten years.

"During this period a tidal wave of taxes has threatened to submerge industry," he continued. "A Chinese wall of laws, rules and regulations limiting its development and circumscribing its activities has been erected around it, and a deep cellar is now being dug under it to accelerate its expected collapse.

"Notwithstanding these disabilities, American business and the American business man have shown remarkable vitality. Instead of capitulating to the forces assailing them, they are still holding out and now show unmistakable signs of a vigorous 'come-back.' Private enterprise continues to be the dominant factor in our industrial scheme. The profits system still lives and now and then shows signs of flourishing. There is no indication that capitalism is cracking under the impact of radical social and economic theories bred and nurtured during the hysteria of the depression. Any institution which can go through what American industry has gone through the last decade and survive can face the future with hope and fortitude."

Col. L. A. Codd, U. S. Army Ordnance Association, gave a general *resumé* of the place of industry in the event of hostilities affecting this nation. He stressed particularly the need for speedy mobilization of all industrial operations to produce war *materiel,* pointing out that we are far better prepared industrially than in 1917.

Education.—In recent years there has been a growing realization of the importance of nonmetals in our national economy. The Mineral Industry Education Division of the institute has given considerable attention to the problems of revising mining-school curricula to allow adequate instruction in the industrial-minerals field. A. F. Greaves-Walker, Department of Ceramic Engineering, University of North Carolina, gave a progress report for a committee that has been studying the situation.

The Pennsylvania State College also has been investigating the problem and W. M. Myers, mineral economist on the School of Mineral Industries faculty, presented a paper on instruction in the industrial-minerals field. He pointed out that the employment of trained technical men in the nonmetallic industries has not kept pace with their development nor grown in proportion to the number concerned with the production of metals. Increasing appreciation of the importance of nonmetals plus a growing trend in the industries to employ more technical assistance has emphasized the necessity of expanding instruction in the curricula of the technical schools. As might be expected from such a diverse group of materials, a number of professions are concerned with their production and utilization. Although they tend to follow the general pattern involved in the technology of metallic ores, they exhibit certain peculiar problems of their own. It must be remembered that many of these materials have little or nothing in common with regard to their occurrence, methods of recovery, or employment in industry.

Mr. Myers answered his own question, "How should instruction in the industrial minerals be organized?", by stating that "in general the answer has been conditioned by local needs and the capabilities of the instructor. Building stones, nonmetallic-mineral dressing, raw materials for the chemical engineer or ceramist may or may not receive recognition by isolation as an individual unit in the curriculum. Such a separation is desirable as it allows treatment of a group of materials that possess some degree of unity. At least their utilization is of interest to a student group possessing a common technical interest.

"A broad, general course in the nonmetallics is often included under that elastic term, 'economic geology.' However, it has already been noted that the actual geology of these minerals is not amenable to treatment as a separate subject. Without intending to minimize its importance it must be admitted that the geology of the industrial minerals is but one of several divisions of equal importance. In addition to geology and properties of the minerals a typical treatment generally includes distribution, production, beneficiation, and utilization.

"One subject which deserves attention above all others is that of marketing and the relationship of chemical composition and physical properties to utilization. This is the single most important feature which makes or breaks a nonmetallic enterprise and ignorance of the subject is often surprising. Literature on the subject is scattered, incomplete and not sufficient to supply the necessary data. Experience is the only school in which a real knowledge of this subject can be attained. Unfortunately many instructors have not had the actual contact with industry which would supply this want. In this field abundant room exists for improvement.

"The marketing of the nonmetals is a subject whose importance can not be over-emphasized and which has received far too little attention in technical education. Any treatment of the subject is inadequate that does not take it into consideration. Many problems are involved. Established prices seldom exist. Published quotations are of little worth in indicating value. The actual price is often a matter of negotiation between the seller and purchaser and is based on demonstration by the producer that his product possesses the peculiar properties necessary for satisfactory use. Slight variations in the percentage of impurities present or alteration in physical properties may make a material unfit for use. Most of the nonmetallic minerals are consumed in use. A circulating load of material does not

build up such as has been the case with iron, copper, lead and some other metals where the secondary metals constantly compete in the markets with virgin metal.

"The beneficial effects obtained by adapting metallurgical practice to the processing of nonmetals has been demonstrated by the increased use of flotation. It seems unquestionable that much more can be accomplished along this line. At least it is a subject whose possibilities should be brought to the attention of the student. Many of the industrial minerals have a low value per ton. They can-not be shipped long distances. Therefore, any improvement in quality produced by improved technology may add value to material near points of consumption. Many of these deposits have place value. They are near enough to the consumer to be of interest if they can be placed in a usable condition. We also have enormous tonnages of many materials awaiting the arrival of a man with the vision to see a use for them. All these things present a challenge to technology and one which must be brought to the attention of students who are being traind for future leadership."

Economics of Industrial Minerals.—The importance of industrial minerals in the development of the South was stressed by Hewitt Wilson of the Bureau of Mines in the opening paper of the program devoted to economics of the industrial minerals. Credit for inaugurating this highly successful session goes to Paul M. Tyler, also of the Bureau of Mines, chairman of the economics committee of the Industrial Minerals Division. Mr. Wilson bemoaned the fact that the South, although producing virtually all varieties of industrial minerals, has not developed manufacturing facilities for their utilization. He particularly stressed the possibilities of a pottery industry. The South has abundant feldspar and kaolin reserves and a wealth of cheap electricity from the T.V.A. In fact, the T.V.A. conducted extensive experiments toward utilizing the raw materials and power of the Tennessee Valley in the manufacture of pottery and the results were claimed to be highly encouraging. This experiment station has since been transferred to the Bureau of Mines, which is continuing the same type of work under the supervision of Mr. Wilson. A discovery of mineralogical interest, although the commercial possibilities if any are still unknown, was the fact that the coarse gravel from an old gold mine has recently been found to be topaz rather than flint.

W. M. Weigel, mineral technologist, Missouri Pacific Railroad Company, then looked into the economics of mineral transport. He commented upon the revolutionary effect of trucks both for haulage in the quarry and for the delivery of materials. The railroads have met this competition to some extent by supplying better service on cars, in particular newly designed cars for special products, such as covered hoppers for bulk cement and tank cars for other finely ground products. Mr. Weigel admitted that the railroads can not compete with trucks on short hauls of gravel, crushed stone, and similar heavy materials but, particularly since the introduction of high-speed freight service, the railroads are meeting the challenge of the trucks in the major part of mineral transport. He divided industrial minerals into three general groups. The first category includes materials such as aggregates, gypsum, and clay, for which the cost of transportation may commonly be higher than the plant value. Customarily such materials move in a relatively small market area and in many districts water transport charges are an important consideration in establishing the rate structure. The second group includes those minerals such as sulphur, salt, bauxite, feldspar, and barite, for which the cost of transport is about the same as or somewhat less than the plant value. Sheet mica is perhaps the best example of the third group, for the cost of transporting good quality mica is but a small fraction of its total delivered value.

Guy C. Riddell sketched briefly the factors involved in mineral-property valuation. He confined his remarks largely to one phase of the problem—present worth — which he termed the backbone of the situation. The present worth is the value to-day of total future earnings. Accurate calculation of this value is the key to a successful career as consulting engineer. Four important considerations in mineral valuation, according to Mr. Riddell, are the profits from known ore, the profits from the expansion of the ore-body, fluctuations in price, and the efficiency of management. The speculative nature of the second and third considerations tends to complicate the problem. Other variables that may enter the picture are changes in capacity of plant equipment, unforeseen physical difficulties, general economic upheaval, and regimentation of industry by government in times of stress. Mr. Riddell made a particular point of the fact that the life of any mining property, for purposes of valuation, is customarily calculated as thirty years. Any reserves beyond this period are of no consequence in calculating present worth unless the capacity of the plant is increased. Lack of adherence to this principle is largely responsible for the complications of the taxing system in various states.

Oliver Bowles of the Bureau of Mines discussed the optimum size of plant. He traced the development of the sand-and-gravel industry from numerous relatively small plants to large centralized operations that develop as a result of stringent specifications. More recently the trend has again been toward smaller plants as a result of ingenious design of portable equipment capable of producing material meeting specifications. A new element in the situation in recent years has been the construction of public works. These projects bear no relation to population and have necessitated the creation of special plants to serve the particular project. This type of plant has been important in advancing the technology of sand-and-gravel preparation. In the lime industry Dr. Bowles pointed out the definite trend from small operations to moderate size and large plants. He stated that a comprehensive study of the sizes of lime plants conducted by the Bureau of Mines indicated that the optimum size of plant was that large enough to be highly efficient but not dependent on distant markets.

In closing the session on economics of industrial minerals H. A. Meyerhoff of Smith College outlined some of the problems of the slate industry of New England. Those attending the session on economics of industrial minerals were well pleased with this innovation in the program.

Particle Size.—F. F. McLaughlin of the General Crushed Stone Company was the author of a paper on preparation and grading in the crushed-stone industry. It was devoted almost entirely to the problem of eliminating "flats and slivers" which are condemned by virtually all concrete engineers. Flats and slivers are commonly defined as particles whose greater dimensions are more than five times their lesser dimensions. They are caused commonly by the natural tendency of stone in some deposits to break into flat or elongated particles and by the tendency of certain crushing equipment to form irregular shapes, particularly if the method of feeding the equipment is not exactly proper. Present-day specifications are very stringent regarding flats and slivers, although there is a great need, according to Mr. McLaughlin, for further definite information and a standardization of specifications. This problem is being studied actively by the National Crushed Stone Association. In actual plant practice experience has indicated that it is particularly important to have the proper angle of nip of the primary crusher, to avoid an excessive ratio of reduction, and to control accurately the

feed to the crusher. J. R. Thoenen, of the Bureau of Mines, pointed out in the discussion that a proper combination of square and elongated screens had proved highly successful in separating flats and slivers, enabling the resultant product to meet specifications.

Gypsum.—The production of disintegrated selenite from calcined gypsum was discussed by S. B. Kanowitz of the Combustion Engineering Corporation. He reported that the process of calcining and grinding gypsum in one operation has been highly successful in preparing material for use in cement or wallboard. Actual results in pulverizing gypsum by this process for other uses are not yet conclusive, although laboratory tests indicate that other grades may be produced. He admitted that the process might take a little more power than conventional methods but claimed greater over-all efficiency resulting in a net saving in costs. The process requires only about 50 pounds of coal per ton of plaster, whereas other kettles use from 100 to 120 pounds per ton.

Flotation.—Flotation received considerable attention. James Norman of the Bureau of Mines and E. W. Gieseke of the American Cyanide Company summarized the results of their work on beneficiation of spodumene rock by froth flotation. Spodumene rocks from six entirely different localities in the United States were studied, and highly selective flotation concentration of spodumene was obtained in each case. It was found that differences in the behavior of these rocks disappeared after proper cleaning of the mineral surfaces and that, after this cleaning, spodumene could be froth-floated from associated minerals by the use of a number of different reagents.

Oleic acid was considered best, as it is cheap and very efficient. The cleaning treatment required varied with the condition of the rock, the more weathered material requiring the more strenuous treatment. The cleaning treatment consisted of vigorous agitation or attrition treatment of the crushed rock in a slurry containing a dispersant, such as sodium hydroxide. After proper cleaning of the crude rock the same flotation treatment, even to approximately the same amount of collector, gave highly selective flotation of spodumene.

It was also shown that spodumene and feldspar could be concentrated together, rejecting the quartz contained in the rock. The mica in the rocks in question was a lithium-bearing muscovite, which remained in the tailing when oleic acid was used as a collector, but by the use of cationic reagents it could be separated from the other minerals. Means of discarding part of the iron-bearing minerals by flotation were also developed.

J. B. Clemmer, H. A. Doerner, and F. D. DeVaney of the Bureau of Mines reported progress on the flotation of Washington magnesite ores. Magnesite ore from the deposits of the Northwest Magnesite Company near Chewelah, Washington, divided as selectively mined into high-grade ore and low-grade mine rejects, was tested for concentration by flotation.

The rejection of siliceous minerals from the high-grade ore by flotation to produce higher-grade magnesite concentrates was accomplished in a pilot plant of 120-pound per hour capacity, using "cationic" type reagents.

Water treatment appeared unnecessary, as similar results were obtained with distilled, soda-ash-treated, zeolite-treated, and a moderately hard tap water.

The three-stage addition of collectors yielded a recovery of 85 per cent. of the magnesite in a product containing less than 1 per cent. SiO_2 and less than 2 per cent. CaO.

The low-grade mine rejects, which contained both siliceous minerals and carbonates, such as dolomite and calcite, were treated by a two-stage flotation procedure. First the siliceous minerals and, unexpectedly, calcite were floated, using cationic-type collectors; then the magnesite was floated from dolomite by usual soap-flotation methods.

The results indicated that a broad range of magnesite products, well within the specifications for refractory magnesite, could be obtained, and the degree of purity desired with respect to the total magnesite recovery could be readily adjustable.

Other papers. — Other papers presented during the sessions of the Industrial Minerals Division included *The Geologist in the Marble Industry,* by G. W. Bain, Amherst College; *The Flagstone Industry of Georgia,* by A. S. Furcron, Geological Survey of Georgia; *Recent Studies of Domestic Phosphate Deposits,* by G. R. Mansfield, United States Geological Survey; *Geology of the Nepheline Syenite Deposits at Lakefield, Ontario,* by N. B. Davis, Canadian Refractories, Ltd.; *The Barite Deposits of Northern Nevada,* by V. P. Gianella, University of Nevada; *Two European Barite Deposits,* by C. H. Behre, Jr., Northwestern University; *Sodium Sulphate Production in the Southwest,* by W. B. Land, United States Geological Survey; and *Fluorite Mining in Newfoundland,* by C. Kelleher.

Unlike previous years few of the papers presented at the meeting are now available in printed or mimeographed form although it is expected that some may be published later. The secretary, A.I.M.E., 29 West 39th Street, New York, New York, can supply exact information regarding the status of any of the papers mentioned in this review.

Overtime-Pay Bulletin Revised and Expanded

A revised and expanded interpretative bulletin on maximum hours and overtime compensation which takes into account the reduction in the maximum work-week from 44 hours to 42 hours, made effective on October 24, 1939 under the Fair Labor Standards Act of 1938, has just been issued by the Wage and Hour Division, U. S. Department of Labor.

The bulletin specifies in clearer language than before that there is no general limitation on the number of hours that may be worked in any one workday, or on a Sunday or on a holiday without payment of overtime, provided no more than 42 hours in the aggregate are actually worked in the workweek. The bulletin also re-emphasizes that the Act takes a single workweek as its standard and permits no averaging of hours over two or more weeks and states that where an employee works 32 hours one week and 52 hours the next week, he must receive time and one-half overtime compensation for the 10 hours over 42 worked the second week, even though the average number of hours worked in the two weeks is 42.

The expansion of the bulletin makes it clear that if an employee earns a regular salary, as for example, $23 a week, but works a fluctuating number of hours, his regular rate of pay will be the average hourly rate each week, figured on the basis of the hours worked that week, and if he works in excess of 42 hours, his overtime will be calculated as time and a half on his average hourly rate for that week.

On the question of the legality of various bookkeeping methods by which employers have resorted to adjustments or manipulations of the hourly rates of pay to avoid the overtime requirements of the Act, the bulletin incorporates in full the opinion issued on October 19, 1939. This states that "in our opinion an employer who will continue to work his employees in excess of 42 hours after October 24 for the same salary they now receive, but who takes the trouble to manipulate the rates of pay in order to adopt a rate upon which he may calculate the time and a half, without incurring any additional labor cost, stands in no better position than the employer who simply and frankly disregards the overtime requirements of the act."

Personal Mention

FINDLAY S. DOUGLAS, formerly special representative, has been appointed assistant to the president of Universal Atlas Cement Company. Mr. Douglas was born in historic Saint Andrews, Scotland, and began his business career in the United States with the Post & McCord Company. Subsequently he was manager of motor and generator sales of Sprague Electric Company, now the Sprague Division of the General Electric Company, which he left to join the Universal Atlas Cement Company. A year after coming to America Mr. Douglas won the United States amateur golf championship, and in 1929-1930 was president of the United States Golf Association and at present is president of the United States Seniors' Golf Association.

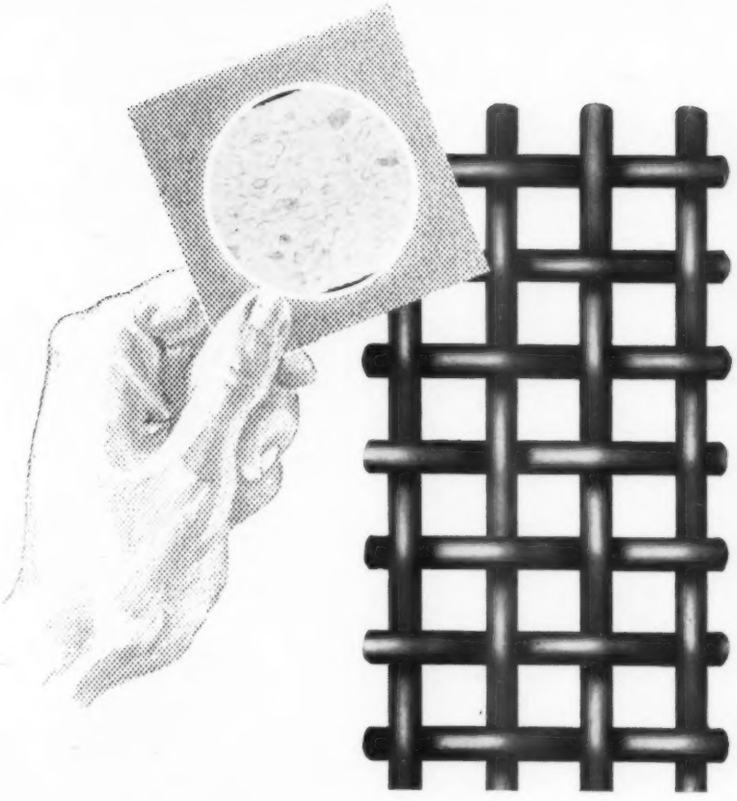
W. R. SOSTHEIM, president and general manager of the New Albany Ready Mixed Concrete Company, New Albany, Indiana, spoke on advertising and selling methods in connection with ready-mixed concrete at a short course conducted at Purdue University recently.

P. A. Wattley

P. A. WATTLEY has been appointed district manager of the Chicago office of the Union Wire Rope Corporation. Mr. Wattley had been employed by the Union Wire Rope Corporation since August 1, 1938 as sales engineer. He was graduated from Clemson College in 1933 receiving a degree in Civil Engineering. For two years he was associated with the Truscon Steel Company in Chicago as a field engineer in the highway and reinforcing department. He also served in the same capacity with the Universal Highway Products Corporation.

WALTER W. ZIEGLER has been named president of the Standard Concrete Products Company of York, Pennsylvania, succeeding his father James A. Ziegler who is retiring from active management after 20 years.

YOU CAN'T FOOL THE *METALLOSCOPE!*



THIS photograph of a section of Roebling Steel Screening Wire was taken in the Roebling Research Laboratory with a photomicrographic camera. It tells a real story to our metallurgists and research men. It indicates instantly and accurately that here is a wire extremely tough and strong—one that will stand up under severest vibration and abrasion!

Hundreds of these photographs—of hundreds of different steels—are on file in our research laboratory. They are tangible evidence of the constant research—the constant effort on a planned basis that is carried on in the Roebling Research Laboratory—to make certain that in Roebling Wire Screening you will always obtain the maximum of lasting, economical service.

We invite your inquiry regarding Roebling Wire Screening for any sizing, cleaning or grading service. It is made in many types and in many metals.

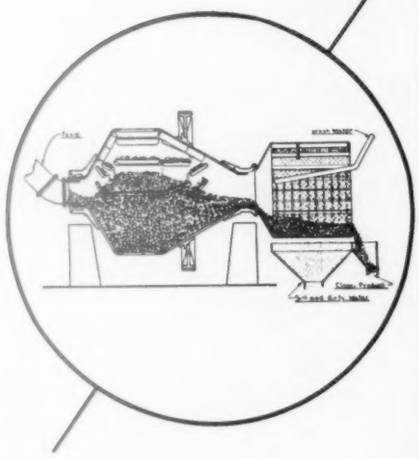
JOHN A. ROEBLING'S SONS CO.
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING ABRASO SCREEN

TRADE JERSEY MARK

90 YEARS OF WIRE MAKING SPELLS THE DIFFERENCE

HARDINGE
says



The **CONICAL SCRUBBER** is the only device that disintegrates clay balls without *damage to* the stone or sand, and which operates with practically no maintenance cost. Write for information and Bulletin.

HARDINGE
COMPANY, INCORPORATED
YORK, PA., Main Office & Works
NEW YORK, 122 East 42nd Street
CHICAGO, 205 W. Wacker Drive
SAN FRANCISCO, 501 Howard St.
TORONTO, 159 Bay Street

E. H. France has disposed of his interests in the Erie Stone Company, with three Indiana plants at Huntington, Wabash and Bluffton, to the France Stone Company of Toledo, Ohio.

James R. Addington, who has been operating vice-president of the American Rock Wool Company, Wabash, Indiana, for several years, has been named president following the recent death of Michael Luery.

B. E. Neal of the Neal Gravel Company has been named president of the Mattoon, Illinois, Chamber of Commerce.

Henry Gray and John Suhr have purchased the plant and assets of the Oceanside Rock & Sand Company and are operating the plant near Hynes, California.

W. E. Deadman, superintendent of the Bonners Springs plant of the Lone Star Cement Corporation has been transferred to the Norfolk, Virginia, plant where he will serve in a similar capacity.

William H. McConochie, formerly treasurer of the Rock Island Sand & Gravel Company, Rock Island, Illinois, has been named president, succeeding the late C. J. Larkin.

Edward D. Emerson, since 1937 district sales manager with the Babcock & Wilcox Tube Company, has been appointed general manager of sales for John A. Roebling's Sons Company, Trenton, New Jersey. Mr. Emerson is a graduate in mechanical engineering, Harvard University, class of 1923. Previous to his employment with Babcock & Wilcox he was for several years sales engineer with the Jones & Laughlin Steel Corporation. He assumes his new duties on March 1.

Ralph E. Roscoe has been appointed vice-president in charge of operations of the Bessemer Limestone & Cement Company, succeeding the late D. C. McKee. Other Bessemer appointments include Harry G. Hinson as assistant secretary and treasurer, and Harry E. Reed, general superintendent.

Martin Larson, manager of the Waupaca Sand & Gravel Company plant at Custer, Wisconsin, was seriously injured recently in an automobile accident.

C. W. Barnes has joined the W. W. Sly Manufacturing Company, Cleveland, in charge of sales promotion and advertising.

D. F. Roddy, lime-kiln operator at Frederick, Maryland, for many years, died recently of pneumonia. He was 83 years old.

Harry W. Sieger, 63, office manager at Egypt, Pennsylvania, for the Giant Portland Cement Company, died January 21 of a heart ailment. He had been connected with the cement industry since 1892 when he went to work for the old American Cement Company.

Jesse W. Bedford, president of the Bedford-Nugent Company, sand-and-gravel producer at Evansville, Indiana, died recently of a heart attack while visiting at Long Beach, California. He was 65 years old.

Arthur V. Vanneman, 56, president and general manager of the Tyrone Lime & Stone Company, Tyrone, Pennsylvania, died suddenly February 8 at his home. He had been in ill health for several weeks.

Fred A. Ballin, 83, founder and former president of the Monolith Portland Cement Company, died February 5 at Los Angeles. He retired from active service eleven years ago.

Raymond Soden, treasurer of the Vincennes Gravel Company, died recently after a short illness. He is survived by the widow, one son and one daughter.

Colonel Arthur F. Townsend, 74, chairman of the board of Raybestos-Manhattan, Inc., and general manager of the Manhattan Rubber Manufacturing Division, Passaic, New Jersey, died recently.

Malcolm C. Sargent, for the past five years district sales manager in New England for Sprout, Waldron & Company, died recently.

John J. Fasmer, until recently general sales manager of the Stephens-Adamson Manufacturing Company, died February 3 at the age of 56.

The Quaker City Rubber Company of Philadelphia has announced a change of name, effective February 1.

In the future the concern, which manufactures conveyor belting, hose and other mechanical rubber goods will be known as the "Quaker Rubber Corporation."

Bay City Shovels, Inc., Bay City, Michigan, announce appointment of the Brinker Supply Company, Pittsburgh, as exclusive representative in western Pennsylvania and northern West Virginia.

Occupational Diseases and the Law

Rehearing

State ex rel. Jonak v. Beall et al., Industrial Commission of Ohio, decided by the Supreme Court of Ohio, January 10, 1940; reported at 16 Ohio Opinions 219, 136 Ohio St. 213. The workman involved in this suit filed an occupational-disease claim, which was denied by the Industrial Commission. His application for rehearing was rejected by the commission, in the absence of any additional proof offered, on the ground that no rehearing is provided by law in occupational-disease claims. This suit is for a writ of mandamus to compel the commission to grant a rehearing.

The essential question for decision was the constitutionality of the statute denying a right of rehearing in occupational-disease cases, which, it is contended, violates the workman's constitutional rights and is discriminatory. The court holds, however, that the only rights involved are those created by Section 35, Article II of the Constitution of Ohio, authorizing the legislature to pass laws providing compensation for occupational disease. The legislature, by enacting Sections 1465-68a and 1465-68b, Ohio General Code, made the Workmen's Compensation Law applicable to occupational diseases, except Section 1465-90, which provided for rehearings. The court rules that the legislature was within its rights in enacting such legislation, and that "where the general assembly, by appropriate legislation authorized by the constitution, grants certain rights to employees in respect to occupational-disease claims, and at the same time withholds certain other rights, this court in a mandamus action can not grant such rights which the legislature failed to give." The writ of mandamus is, accordingly, denied.

Phosphorus Poisoning

Malzac v. Salmio et al., decided by the Supreme Court of Minnesota, December 8, 1939; reported at 288 N. W. 837. The Minnesota Workmen's Compensation Act enumerates among compensable occupational diseases (Mason's Minnesota Statutes, 1927, Section 4327) "phosphorus poisoning or its *sequelae*"

They...CROWDED AROUND

to see the Brooks LOAD LUGGER

AND WHAT They SAID:

"That dump-truck is a honey!"
"Oh boy! It's fast. My watch says 18 seconds for the lift."
"Sweet engineering job, too."
"Got 'em all skinned for simplicity. Gadgets mean trouble."
"That's a whale of a bucket for a small truck. What a load!"
"It's the answer to my problem."

The new Model "CH" went over big at the American Road Builders Convention, as the most advanced type of multi-body dump truck for reducing costs on hand loading jobs. Fast action, streamline design and ease of operation, were outstanding features that made a hit with the crowd. If you did not attend the Road Show, be sure to send for the details of this modern material-handling unit.

BULLETIN No. 209-A tells the whole story. Write for your copy

BROOKS EQUIPMENT & MFG. CO.
103 Davenport Road, Knoxville, Tenn.

MORE crusher FOR LESS money!

● Now you can have that secondary crusher you need. Here's a genuine Telsmith — priced so low that you can't afford *not* to buy it—especially when the Intercone gives you such big capacity and steady production of ½ to ¾-in. rock at astonishingly low operating cost.

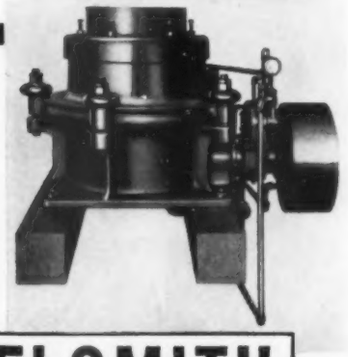
For years Telsmith has been designing and building crushers . . . of various types . . . each in some special way bettering crushing practice. Each has contributed some modern feature to the Intercone and the economy of its first cost.

THE ONLY LOW PRICE CRUSHER WITH THESE FEATURES

high speed • large capacity • wide range of fine sizes • strong steel structure • lead-bronze eccentric sleeves • manganese steel wearing surfaces • force-feed lubrication • protection against tramp iron.

Get Literature and Prices

SMITH ENGINEERING WORKS
504 E. Capitol Drive
Milwaukee Wisconsin



TELSMITH INTERCONE CRUSHER

PEERLESS INCREASES THEIR DUST FILTER CAPACITY 59%

Through Modernization . . . using their old case

The outstanding results being achieved in more efficient production and better dust control *through modernization*, are well illustrated by what the Peerless Cement Corp. at Detroit, accomplished.

They had an 18-foot dust arrester purchased some years ago. By installing new Sly dust filter parts in only 12 feet of their old case they increased the net cloth filtering area by 59%. The balance of the case they converted into a classifier or settling chamber, resulting in the precipitation of a large percentage of the dust without actually entering the cloth filter section—thereby increasing efficiency of filter, prolonging life of bags, and reducing static resistance to flow of air, saving substantially on power for fan.

Sly filter parts are suitable for other filters as well as Sly, so if you have an old filter of any type, let's see what you can save by modernization.

THE W. W. SLY MFG. CO.

Branch Offices in Principal Cities

4745 TRAIN AVENUE CLEVELAND, OHIO

PERFORATED METAL SCREENS

FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

Prompt Shipment

CHICAGO PERFORATING CO.

2435 W. 24TH PLACE CHICAGO, ILL.

Telephone CANAL 1459

if the employee was employed in "any process involving the use of phosphorus or its preparations or compounds." The claimant in this case obtained an award for temporary disability and medical expenses resulting from a skin disease found to be due to the use of a washing powder containing trisodium phosphate. The court finds from the evidence that the disease was "phosphorus poisoning" within the meaning of the statute, and that the use of the washing powder was a "process involving the use of phosphorus or its preparations or compounds." The award of compensation is affirmed.

Aggravation of Disease

Aetna Casualty & Surety Company, et al. v. Chandler, decided by the Court of Appeals of Georgia, October 27, 1939, rehearing denied December 13, 1939; reported at 6 S.E. (2d) 142. In this case the court applies the rule that while the Georgia Workmen's Compensation Law, Code Section 114-102, does not contemplate any disease "except where it results naturally and unavoidably from the accident," an injury which aggravates a pre-existing disease is compensable "where such increased result would not have occurred except for the injury." The facts of the case, however, are found not to come within the rule. The claimant was the widow of a workman who died of encephalitis after lifting heavy garbage and ash cans in the course of his employment. The compensation board (Department of Industrial Relations) and the Superior Court found that the deceased's work aggravated the disease and brought on the hemorrhage which caused death. The Court of Appeals finds that this conclusion is contrary to the evidence, and reverses the decision which awarded compensation.

Injury

Griggs v. Lumbermen's Mut. Casualty Company, et al., decided by the Court of Appeals of Georgia, November 25, 1939, rehearing denied December 19, 1939; reported at 6 S. E. (2d) 180. In this case the Industrial Board awarded compensation to a workman who was disabled by paralysis due to a cerebral hemorrhage caused from continuous labor in lifting heavy objects, while he was suffering from arteriosclerosis. On appeal, the Superior Court reversed the award on the ground that the disability was from an uncompensable occupational disease, following the precedent of the silicosis cases. The Court of Appeals holds that the precedent of the silicosis cases does not apply; that the disability in this case was within the statutory provisions concern-

ing "injury" and "personal injury," and that the claimant was not suffering from "an occupational disease growing out of the nature of his work." The award of compensation, accordingly, is confirmed.

When Compensation Accrues

Natural Products Refining Company v. Court of Common Pleas in and for Hudson County et al., decided by the Supreme Court of New Jersey, January 2, 1940; reported at 10 Atl. (2d) 148. This case, notwithstanding its title, was a contest between two insurance carriers, to determine which was liable for the payment of compensation to a workman who was incapacitated from an occupational disease (chrome poisoning). The solution depended upon when the incapacity occurred. The court holds that the test in New Jersey for the time when compensation accrues is when incapacity or death from occupational disease occurs. The determining date must be the date when the employee is no longer permitted to continue the occupation which caused his injury, regardless of subsequent employment in other work which resulted in loss of wages. The insurance carrier at the time that incapacity occurred is held liable for payment of the compensation.

Trade Literature

Faster Diesel Power, (32 pages). Allis-Chalmers Manufacturing Company, Milwaukee.

Polyclone Dust Collectors, (4 pages). Western Precipitation Corporation, Los Angeles.

Atlas Explosives, (44 pages). Atlas Powder Company, Wilmington, Delaware.

One Truck With a Litter of Bodies, (fo'der). *Making One Do the Work of Many,* (folder). Brooks Equipment & Manufacturing Company, Knoxville, Tennessee.

Eagle Truck-Mounted Loader, (4 pages). Eagle Crusher Company, Inc., Galion, Ohio.

The Asam Chevrolet 4-Wheel Drive Truck, (4 pages). Asam Motor Company, Detroit.

Diamond Jaw Crushers, (12 pages). Diamond Iron Works, Minneapolis.

Hose Hints, (32 pages). United States Rubber Company, New York.

Link-Belt Conveyors in American Industry, (48 pages). Link-Belt Company, Chicago.

Pneumatic Collecting and Conveying Systems, (64 pages). B. F. Sturtevant Company, Boston.

Barber-Greene Bituminous Mixers, (56 pages). Barber-Greene Company, Aurora, Illinois.

Drive Chains, (84 pages). Jeffrey Manufacturing Company, Columbus, Ohio.

Single-Stage, Split-Case Centrifugal Pumps, (24 pages). Fairbanks, Morse & Company, Chicago.

Morse Roller Chain, (24 pages). Morse Chain Company, Ithaca, New York.

Expert Experience
in FINE MESH SCREENING
POINTS
to THE Leahy HEAVY DUTY
V-BELT MOTOR DRIVEN VIBRATING SCREEN with TRI-VIBE

Write for BULLETIN No. 14-H

Single surface, open-type Motor driven Screen. Also made in double deck, dust-proof or enclosed models.

☛ Aggregate producers, who are "in the know," base their purchases on proved designs and performance figures. The expert buyer of screening equipment will quickly sense the importance of these LEAHY Features:—

☛ TRI-VIBE, because of its triple-vibrating action on every square inch of the screen, prevents blinding, increases capacity and insures uniformity.

☛ Efficiency ratings average between 90% to 97% in sustained operations with the LEAHY Type C Vibrating Screen.

☛ Only ½ HP is required under maximum load.

☛ Maintenance costs run less than 1% of the original investment yearly.

Diagonal-Deck Deister-Overstrom Sand Treating Table

THE DEISTER CONCENTRATOR COMPANY
The Original Deister Concentrator Company
Est. 1906
911 Glasgow Ave. Fort Wayne, Ind.

Spray Nozzles • Duplex Washing Tables • Leahy Screens • Constriction Plate Classifiers

ARRESTS DUST?

Yes, of course. But it makes you money, too.

● Dust is a menace, but this menace can be eliminated and turned into an asset if you will collect and sell it as agricultural limestone.

From your crushers, from your screens, bins, elevators—everywhere you rehandle your stone, you are sending dust into the air, spreading it on the floor, steps, turning your plant, which would otherwise look neat, into a place even your employes think of without pride. It filters into your bearings, your motors, your lungs.

Collect it! Sell it!

It doesn't cost much to do this. A Parsons Unit type Dust Arrestor, built to handle 2,000 cu. ft. of air, complete with fan and 5 h.p. motor costs surprisingly little. It comes ready to set in place and connect the dust pipes. Simple but highly efficient.

You can afford it. And when you figure it out, you can't afford to be without it! Get more information today.

A COMPLETE LINE OF DUST ARRESTORS
Automatic... Oval Type Bag... Unit Type Oval Bag... All Metal Parclone

PARSONS

PARSONS ENGINEERING CORPORATION
3595 E. 82ND STREET — CLEVELAND, OHIO

Labor Decisions

Strike Violence

Republic Steel Corporation et al. v. National Labor Relations Board, decided by the U. S. Circuit Court of Appeals, November 8, 1939; reported at 107 Fed. (2d) 472. This case was before the Court for a review of an order of the National Labor Relations Board. The court finds that there was substantial evidence to support the Board's findings and its conclusion that the corporation had engaged in unfair labor practices within the meaning of the National Labor Relations Act by interfering with, restraining and coercing its employees in the exercise of their rights of self-organization, by dominating and interfering with the formation and administration of the employee representation plans and associations of its employees and by contributing support thereto, and by discriminating in regard to the employment of specified employees. That part of the order directing the corporation to cease and desist from such practices is, accordingly, sustained. The court also upholds those parts of the board's directions for affirmative action requiring the company to withdraw recognition from company-dominated labor organizations, and to post notices of such action; requiring the company to reinstate with back pay certain employees who were discharged for union activities, or refused reinstatement after a strike because of union membership; and requiring the company to reimburse certain employees for the pay lost during lockouts.

The major controversy in the case was over the reinstatement, or placing on a preferential list, of certain employees who went on a strike which was alleged not to involve an "unfair labor practice." This issue was, in general, decided against the company. Certain of these employees, however, had been guilty of criminal conduct in connection with the strike. The court points out that "some disorder is unfortunately quite usual in any extensive or long drawn out strike. . . . Violence of this nature, however much it is to be regretted, must have been in the contemplation of Congress when it provided in Sec. 13 of the Act, 29 U. S. C. A. § 163, that nothing therein should be con-

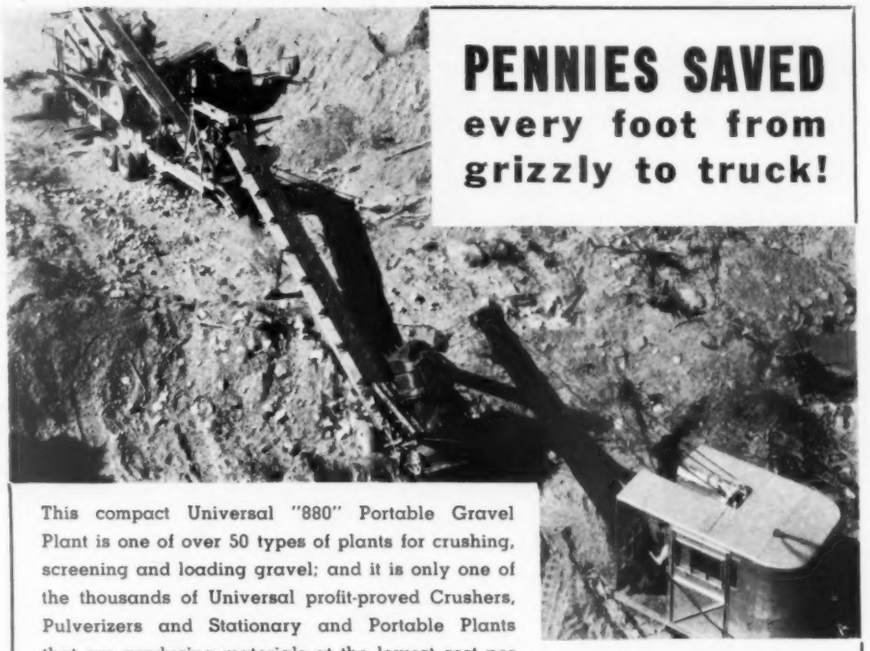
strued so as to interfere with or impede or diminish in any way the right to strike. If this were not so the rights afforded to employees by the Act would be indeed illusory." The Court follows its earlier decision in *National Labor Relations Board v. Stackpole Carbon Co.*, 105 Fed. (2d) 167 (certiorari denied, 60 S. Ct. 142), that it was not intended by the Act that minor disorders of this nature should deprive a striker of the possibility of reinstatement. Some of the strikers who had been convicted in state courts of serious offenses were denied reinstatement by the Board's own order. The Court modifies the order to deny reinstatement to certain others convicted of crimes which it deems sufficiently serious to bar reinstatement. As to the remaining offenses proved to have been committed, the Court is satisfied from their character and from the small penalties imposed in the state courts that they were sufficiently minor to come within its decision in the *Stackpole* case, and the order of the Board directing the reinstatement of the persons involved in them will be enforced.

Working Employers

Master Plumbers Association of Albany v. Weir et al., decided by the New York Supreme Court, Appellate Division, Third Department, November 22, 1939; reported at 15 N. Y. S. (2d) 889. The question involved in this suit was the legality of a proposed agreement between a membership corporation, whose members are engaged in installing and repairing plumbing and heating work, and a labor union. In the proposed agreement the union insists that there shall be a provision that working employers handling the tools of the trade pay dues and abide by the rules and regulations of the union. The corporation contended that this would be a violation of Section 704 of the Labor Law, which provides that it shall be an unfair labor practice for an employer to contribute financial or other support to any employee organization. The court holds, however, that this provision was not intended to apply to persons who labor with the members of the union, and that the payment of dues by working employers would not be a means of obtaining the domination or influence over the union which the Labor Law forbids. The proposed agreement is held not to violate either the spirit or the obvious intent of the statute.

Former Employees

National Labor Relations Board v. National Casket Company, Inc., decided by the U. S. Circuit Court of Appeals, Second Circuit, December 11,



PENNIES SAVED
every foot from grizzly to truck!

This compact Universal "880" Portable Gravel Plant is one of over 50 types of plants for crushing, screening and loading gravel; and it is only one of the thousands of Universal profit-proved Crushers, Pulverizers and Stationary and Portable Plants that are producing materials at the lowest cost per yard, year after year.

Get the facts — write for new catalog and user reports!

UNIVERSAL CRUSHER CO.
619 C Ave. West
Cedar Rapids, Iowa

UNIVERSAL

The extra STRENGTH is in the *Spiral*

THE once necessary evil of using *heavier* pipe than was needed in order to obtain the required *strength*, was wiped out when Taylor Forge pioneered spiral pipe.

That spiral seam makes it possible to produce a pipe that is light walled and therefore less expensive to buy, ship, and use—yet strong in every way, thanks to the spiral reinforcement which stiffens it from end to end—holds it round and true against collapsing strains—gives it bursting strength even beyond that of a seamless tube of equal gauge.

You simply choose the gauge you need for the job, never paying a penalty for superfluous weight. Let it cut the cost of water, sand and gravel lines. Ask for the new Catalog 36.

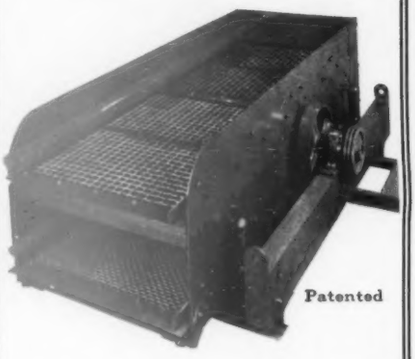
TAYLOR FORGE & PIPE WORKS
General Offices and Works: Chicago
P. O. Box 485
New York Office: 50 Church Street

TAYLOR *Spiral* PIPE

ASK FOR CATALOG 36

SECO

Vibrating Screens



MAKING NEW FRIENDS EVERY DAY BY DOING A BETTER JOB

SCREEN EQUIPMENT CO. INC.
9 Lafayette Ave. BUFFALO, N. Y.

OSGOOD

POWER SHOVELS
DRAGLINES
CRANES
TRUCK SHOVELS, Etc.
3/8 to 2½ Cu. Yds.

Write for New Catalogs

THE OSGOOD CO.
MARION OHIO

1939; reported at 107 Fed. (2d) 992. The essential question for decision in this case was "whether it was an unfair labor practice to refuse to employ, because of their prior union activities, workmen who had ceased to be employees long before the [National Labor Relations] Act came into effect but who thereafter and when work was available applied for employment." The workmen concerned had been discharged, before the act went into effect, for union activities. The National Labor Relations Board ordered their employment with back pay from the time the company refused to employ them on their applications after the act became effective.

The court emphasizes that it is not a question of "reinstatement of employees," since the workmen had ceased to be employees, and did not retain their status by virtue of the definition of "employee" in Section 2(3) of the act. The board's argument, says the court, treats them merely as applicants for work "and advances the broad proposition that the act forbids discriminatory refusal to employ an applicant because of his union affiliations, and justifies awarding to him the compensation he would have earned, if the employer had not preferred to employ a non-union man."

The court rejects such a construction of the act. "The purpose of the act is not to compel an employer to hire members of one union rather than another, or union men rather than non-union men. We do not understand, therefore, that an employer may not, under pain of committing an unfair labor practice, select an A. F. of L. member in preference to a C. I. O. member, or a non-union man in preference to either, if all three are applicants for the same position. . . . Between applicants for work who are not employees at the time they apply for employment we think the employer is free to choose one who has not previously engaged in union activities in preference to one who has, and *vice versa*, although he may not impose by the contract of employment any limitation in respect to union or anti-union activities during the term of employment."

The board's order conflicting with these views is reversed.

Through a recent transaction the Buckeye Traction Ditcher Company, Findlay, Ohio, now owns all Emsco tractor equipment patents, also those patents under which Emsco was licensed or had working agreements and all Emsco applications for patents.

Wm. H. Schomburg, executive vice-president, also announces that this tractor equipment is being manufactured at Findlay, Ohio, exclusively and that domestic sales are handled from the Buckeye general office in Findlay.

IT COSTS NO MORE TO USE THE BEST

REPLACE WITH
"Indian Brand"
MANGANESE STEEL

LONG LIFE
ABRASION
RESISTING PARTS
FOR
QUARRY, ROAD,
DREDGING,
AND
MINING MACHINERY

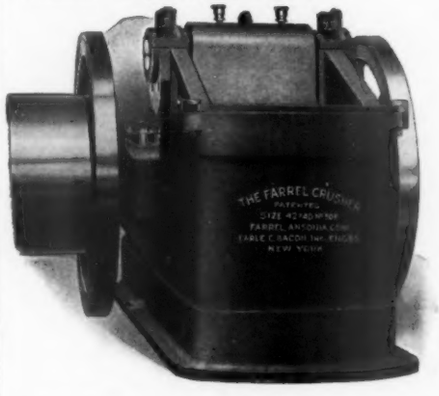
The Frog, Switch & Mfg. Co. CARLISLE, PA.

ESTABLISHED 1881

FARREL BACON

CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service



EARLE C. BACON, Inc.
17 John St. New York, N. Y.

Traffic News Digest

Sand, Gravel, and Stone.—Docket No. 28165, National Erie Corporation *v.* New York Central. By division 2. Rate $1.20 a net ton, sand shipped between March 19, 1935, and December 19, 1936, from Polk to Erie, Pennsylvania, over an interstate route, found to have been applicable and unreasonable, but not otherwise unlawful. The rate was found unreasonable to the extent it exceeded $1.10, and reparation of $5.54, with interest, was awarded.

Examiner Frank C. Weems upheld the failure of the Public Utilities Commission of Ohio to include in a rate of $1.05 a ton of 2,240 pounds the increases authorized in Ex Parte No. 123. The docket number is 28218, intrastate rates on fluxing stone in Ohio.

The intrastate rate of $1.05 applies on fluxing stone, in carloads, from Marblehead, Ohio, to destinations in the Mahoning valley. The examiner found that the failure of the Ohio commission to include the increases in the rate did not cause undue prejudice to persons or localities in interstate commerce nor unjust discrimination against interstate commerce nor undue preference of, or advantage to, intrastate commerce or intrastate shippers. The examiner recommended discontinuance of the proceeding and also stated that to increase the Marblehead rate to the level of $1.16 a ton as sought by the railroads would diminish the carriers' revenue.

In Docket 28252 (Codell Construction Company *v.* C. & O.) Examiner P. F. Mackey proposes dismissal. This docket covers rates on sand and gravel, applied on shipments made since October 19, 1936, from R. A. Junction, Ohio, to destinations in Kentucky, over lines of the C. & O., proposed to be found not to have been or to be unreasonable.

Proposed Requirements for Traffic Managers.—Bill No. 147 introduced January 9 in the New York state assembly proposes that "thorough study and investigation of the educational and professional qualifications necessary and desirable for freight-traffic managers and freight clerks should be made with the idea of determining what particular qualifications should be imposed or standards set for persons to qualify as experts in such professions; and if such occupations should be classified as professions." This bill was introduced by Assemblyman William J. A. Glancy of New York City and as referred to the assembly's committee on ways and means.

It is proposed that a "temporary state commission" would be appointed. It would consist of nine persons, two of which would be employees of railway carriers, two from the motor-carrier industry, two from the marine-traffic field and two others, "qualified and outstanding members of their respective fields in the traffic profession." The ninth member would be the state commissioner of education, who would be chairman. The bill proposes that the commission submit a report to the legislature by March 1, 1941, including, if it believes it to be required, a bill to make its recommendations law. An appropriation of $10,000 is provided for expenses and personnel hire. The commissioners would serve without salary.

NO CRIMPING "FINGER PINCH" THAT SPOILS WIRE ROPE

When a Laughlin drop forged Safety Clip takes hold of wire rope, it means business. The solid fist-like grip is 50% more efficient than ordinary U-Bolt Clips, as proved by recent tests at a famous engineering school.

You also save the rope that would ordinarily be cut off after being crimped by the "finger pinch" action of U-Bolt Clips. Laughlin Safety Clips, when removed, leave the rope straight, uncrimped, ready to use again.

FEWER CLIPS NEEDED. Where you've been using four ordinary U-Bolt Clips, you will need only three Laughlin Safety Clips to get the same strength.

FASTER TO APPLY. Laughlin Safety Clips have nuts on opposite sides — easy to get at — you can use two wrenches at once. That saves time — and many a cuss-word.

Write for the free booklet giving results of tests made by a famous engineering school. Take the first step to saving some real money by mailing the coupon now.

THE THOMAS LAUGHLIN CO.
Portland, Maine

Please send me free Safety Clip booklet. P-2

Name.....

Company.....

Address.....

Check here for catalog on items below ☐

Look for Laughlin products in Thomas' Register and buy through your distributor.

For greater dragline yardage dig with a Page Automatic!

A bucket for every machine and job; capacities 3/8 to 15 cubic yds.

As they have for other users, Page Automatic Dragline Buckets can help you increase yardage and profit. The patented rounded-front design forces Automatic Buckets to use all their weight most effectively for digging; out-dig other buckets of equal size and weight.

See your equipment dealer or write direct for information about a Page Automatic Dragline Bucket of a size and weight for your machine and job!

PAGE ENGINEERING COMPANY

Page Automatic Dragline Buckets · Page Walking Dragline Machines

CLEARING POST OFFICE, CHICAGO, ILLINOIS

Motor-Truck Reports.—Portland, Oregon.—MC 100,867, John O. Kish, contract carrier application, Joint board 45. Served January 16. Permit recommended. Rock, sand, and gravel, over irregular routes, from points in Clark County, Washington, to Portland, Oregon, with no transportation for compensation on return. Modified procedure. Hearing on request. Exceptions, if any, must be filed within 30 days from date of service.

Gary, Indiana.—MC 100,785, Nick Carr, doing business as Carr's Motor Service, common carrier application. Joint board 21. Served January 30. Certificate proposed. Building materials from Danville, Sterling, Thornton, South Chicago, and Joliet, Illinois, to Gary, Indiana, and points in Indiana within 100 miles of Gary, and over irregular routes.

Upper Darby, Pennsylvania.—MC 100,017, Robert Finney Swisher, contract-carrier application. Joint board 67. Served February 1. Denial of permit proposed. Lime products from Limecrest, New Jersey, to Philadelphia, Pennsylvania, and points within 25 miles thereof, over a specified route.

Little Rock, Arkansas.—MC 82,729, Sub. No. 1, Frank Graham, extension of operations. Joint board 229. Served February 10. Certificate proposed. Lumber, sand, gravel, engines, machinery, and parts thereof, between certain points in Arkansas, Mississippi, and Tennessee, over irregular routes.

Truckers Define Carriers.—At a meeting February 8, the board of governors of the common carrier division of the American Trucking Association, adopted a declaration of policy on the subject of contract carriage and a statement of principles of contract carriage.

The following are the principles of contract carriage which were adopted:

1. True contract carriage is essentially a substitution for private carriage, and of necessity, therefore, must be performed under the supervision and direction of the employing shipper and as an incident to and within the policies of the conduction of his principal business.

2. Since contract carriage is essentially a private carriage, it must necessarily follow that the merchandise of only one shipper can be on one vehicle at one time as, obviously, private carriage can not be performed for more than one person at the same time and with the same equipment.

3. Following the same premise of substitution for private carriage, it is also apparent that each individual contract must be the subject matter of a separate permit.

4. To eliminate abuses such as on the filing of contracts after the movement has taken place and to enable the commission to measure the terms of the contract as offered, a specified time should elapse between the filing of the contract and the commencement of operations thereunder. Suitable provisions should be made to allow for expeditious handling of emergency or urgency cases similar to the procedure for such emergencies provided under tariff requirement for common carrier.

5. The filing of an application for a permit should be accompanied by a copy of the actual contract showing all details, including the actual charges. Notice of such application should be furnished to all carriers within the area, including full details, except the charges. The actual charges should not be made a matter of public information except upon a finding by the commission that such charges should be opened in the public interest. If the terms of the contract as filed with the application are compatible with the principle of substitution for private carriage and not merely a disguise for a cut rate, the actual charges would seldom be of interest and practically never a real determining factor.

YOU CAN LOOK

But you won't find

THE MOST IMPORTANT THING IN A CONVEYOR BELT SPECIFICATION!

Yes, you will find width, plies, length . . . everything . . . except inbuilt quality, stamina, superior construction, scientific knowledge and experience of manufacturer.

There is no common denominator for those factors, yet they are the big reasons why Cincinnati Conveyor Belts build remarkable tonnage records . . . give record making years of trouble free service . . . and achieve unusually low belt costs per ton conveyed.

For maximum return on your conveyor belt expenditure, specify all the factors you can . . . then let "Cincinnati" add those intangible ones that make Cincinnati Belts a most profitable investment!

THE CINCINNATI RUBBER MFG. CO. CINCINNATI, O.

This Cincinnati Conveyor Belt gave 9 years of outstanding operation conveying sand and gravel . . . when taken out of service another Cincinnati Belt immediately replaced it. Belt is 525 ft., 30 in. x 6 ply.

Name on request

CINCINNATI CONVEYOR BELTS

LOW COST CRUSHING FOR 55 YEARS

ROADS whether mountain or farm to market under any condition

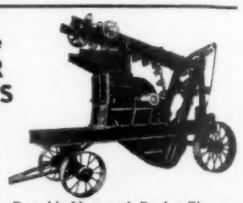
you can depend on

GRUENDLER EQUIPMENT

Write for our 16-page Catalog and Specifications

Stationary or Portable HAMMER CRUSHERS

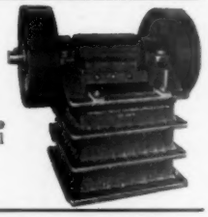
Ideal for farm to market road work. Crushes stone to 1" minus or to fine agriculture dust.



Portable Unit with Bucket Elevator

Bronze or Roller Bearing **JAW CRUSHERS**

Heavy Armor plate steel or cast steel Constructed
Large capacity
Small power Requirements



STRAIGHT LINE ROCK AND GRAVEL CRUSHING AND SCREENING PLANTS

GRUENDLER

CRUSHERS · PULVERIZERS · GRINDERS

GRUENDLER CRUSHER & PULVERIZER CO.
2915-21 N. Market St., St. Louis, Mo.

6. Each contract being a separate permit, it would follow that the terms of each could be measured in the light of any other contract or contracts held by the permittee and no permits should be issued on the theory of back haul or added traffic.

Motor-Act Prosecutions.—Judge Robert M. Gibson, in the federal court for the western district of Pennsylvania, has imposed fines of $500 each on Catherine Bartoletta and Bruno Calabria, co-partners, doing business as North Braddock Motor Lines, North Braddock, Pennsylvania, on pleas of guilty to an information charging violations of the motor-carrier act, according to a statement by Acting Secretary Laird of the commission. The company operates as a common carrier in the transportation of general commodities, with exceptions, between points in Pennsylvania, New Jersey, and New York. The information charged the defendants with transporting certain commodities, in one instance, without a certificate and without having rates on file, in another, without rates on file, and in a third, at rates lower than those specified in their tariffs.

The commission also has been advised that a fine of $1,000 was assessed against J. Roundtree, doing business as Ozark Motor Lines, Dallas, Texas, on a plea of *nolo contendere* to an information charging him with knowingly offering, granting and giving concessions to shippers and consignees in violation of the motor-carrier act. The fine was imposed by Federal Judge T. Whitfield Davidson of the Dallas division of the northern district of Texas. Of the fine assessed, $500 was paid, and the remainder was suspended for a year in which the defendant was placed on probation. The criminal charges, according to a statement issued by Secretary Bartel of the Commission, were based on the transportation of general commodities for various shippers between points in Texas, Louisiana, and Arkansas. A comparison of the rates assessed and collected by Roundtree with those lawfully applicable, the statement said, disclosed concessions ranging from 8 cents to $54.22 a shipment.

Riley to Lecture.—Gordon E. Riley, traffic manager of the U. S. Gypsum Company, is one of the traffic men who will lecture in the traffic-management course which Northwestern University is giving in night classes at its downtown Chicago campus. Courses are being given in the principles of air transportation, traffic management, and freight rates and classification.

The Magnetic Engineering & Manufacturing Company has recently been organized to design and build a complete line of magnetic separators, magnetic ore concentrators, magnetic chucks and clutches and other special magnetic equipment.

The officers of the company are: J. J. Ferris, President, J. L. Hope, vice president, and F. E. Ferris, secretary and treasurer.

Mr. Hope was formerly chief engineer of the Dings Magnetic Separator Company, and was with that company for the past 21 years. J. J. Ferris was general manager of the Dings Company, having been affiliated with that concern for the past 11 years.

Home offices and plant are at Clifton, New Jersey, and branch sales offices are rapidly being opened throughout the country.

Reflecting increased industrial demand, Bay City Shovels, Inc., began operating two 9-hour shifts daily on February 5 at its plant in Bay City, Michigan. This stepping up of production comes two months earlier than it did last year. The company reports increased demand, particularly for shovels in the larger sizes. The present production schedule is expected to continue into the autumn months.

New Machinery and Supplies

• Speed Reducer

The Brad-Foote Gyro reducer consists principally of one stationary internal gear—a double spur or combination spur and internal gear mounted on ball bearings on a shaft eccentric to the pitch line of the stationary internal gear. In mesh with the secondary gear is either a spur or internal gear which is solid and concentric with the output shaft—the input shaft is usually traveling at motor speed—forcing the initial spur gear to travel around the pitch line of the stationary internal gear. The initial spur and the secondary gear are solid; therefore, the speed of the secondary gearing is controlled by the ratio between the initial spur gear and the secondary internal gear.

The ratio between the secondary gears when the output gear is an internal gear, is a multiplication of the ratio of the initial spur gear to stationary internal gear and the ratio of the secondary spur gear to the output internal gear.

When the output gear is a spur gear, by necessity the secondary gear mounted on the eccentric must be an internal gear. In this case the ratio between the secondary gearing is a differential of the ratio between the initial spur gear to the stationary internal gear, and

"KING" Double-Bolt Hose Clamps

For ALL Types of Suction and Discharge Hose

The "KING" Double-Bolt is a clamp of superior strength and sealing power, with exclusive quadruple take-up feature. Half-sections of clamp are so shaped that when bolts are pulled up, they force the hose into groove on nipple or corrugation on shank of coupling. Seepage or leakage is impossible. Double-tongue saddles are extra long and full width. Cadmium plated—rustproof. Sizes: For hose with O. D. from 3½" to 17¼".

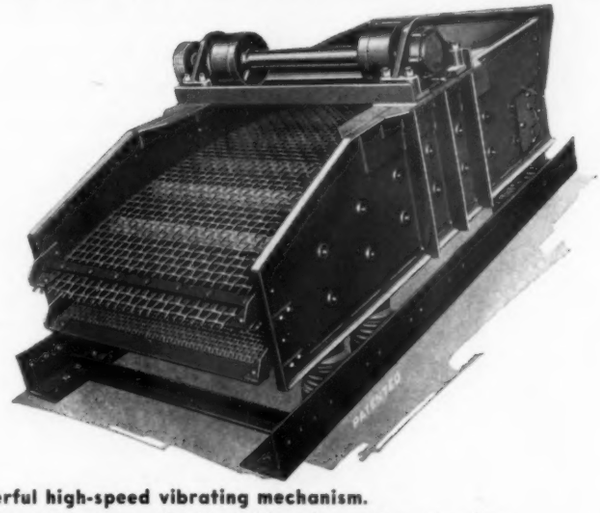
Carried in Stock by Leading Rubber Manufacturers and Jobbers

DIXON VALVE & COUPLING CO.

MAIN OFFICE AND FACTORY—PHILADELPHIA, PA.

Branches: Chicago Birmingham Los Angeles Houston

DEISTER PLAT-O VIBRATING SCREEN



1. Powerful high-speed vibrating mechanism.
2. Screen cloth automatically held under uniform tension.
3. Any one screening surface changed without disturbing remaining decks.
4. Cushioned vibration.

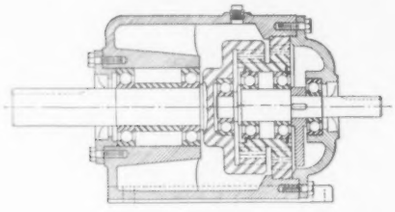
DEISTER MACHINE CO.

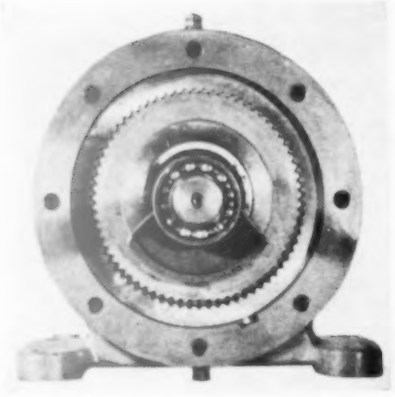
1933 E. WAYNE ST. FT. WAYNE, IND.

Canadian Licensee and Manufacturer:
Manitoba Bridge & Iron Works, Ltd., Winnipeg

the secondary internal gear to the output spur gear.

To obtain large ratios between a spur gear and an internal gear, there must be a very small difference in the number of teeth between the spur gear and the internal gear; therefore, the Gyro reducer takes advantage





Sectional sketch and interior view of the speed reducer.

of the eccentric lever. The mechanical leverage involved is the ratio between the eccentric radius and the pitch line radius of the stationary internal gear times the leverage of the eccentric radius to the radius of the pitch line of the output gear.

The Brad-Foote Gyro reducer is made by the Foote Gear Works, Cicero, Illinois.

● Truck Scales

Three complete lines of motor-truck scales, comprising 128 different styles with weighing capacities up to 70,000 pounds, are announced by the Toledo Scale Company for 1940. Although motor-truck scales have been manufactured by this company for many years, this marks the first extension of the line to cover every demand in this growing field.

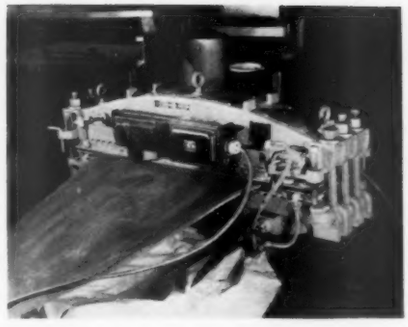
The three lines are: (1) Toledo—A.R.E.A. scales, engineered to the rigid specifications sponsored by the American Railway Engineers Association, forty regular styles, capacities to 70,000 pounds. (2) "Truckmasters"—designed for installation where usage is less severe, 48 styles, capacities up to 65,000 pounds. (3) "Truckweigh", beam-type commercial scales, 40 styles, capacities up to 61,000 pounds.

Models will cover a full range of lever sizes, for platforms up to 40 feet by 10 feet. They will also offer a complete selection of weight-indicating methods — automatic dial, beam, type-registering beam, beam indicator, and printweigh ticket-printer.

● Belt Vulcanizer

The B. F. Goodrich Company announces an addition to its line of belt vulcanizers, designated as the 36-42. The vulcanizer is made for Goodrich by the James C. Heintz Company.

The new vulcanizer has a platen 12 inches wide and long enough to span a 36 inch belt when the vulcanizer is clamped on the belt at approximately a 22½-degree angle with reference to a line drawn at right angles to the edge of the belt. The vulcanizer also may be used on a 42-inch belt, but it must be



Vulcanizer for fastening conveyor belts.

placed across the belt at approximately 12 degrees from a line drawn at right angles to the edge of the belt.

It is plugged in on the circuit as easily as an electric fan, and does not require watching. Equipped with positive thermostats, the proper vulcanizing temperature of 287 degrees Fahrenheit is automatically maintained.

Current is turned on and off with variations of only one degree in temperature, while an adjusting screw on the side of the control case permits adjustment to any temperature from 220 to 315 degrees Fahrenheit.

By following simple directions there is no danger of under vulcanizing or over vulcanizing the belt. Efficient location of the heating elements and accuracy of control assure uniform heat distribution over the entire platen surface.

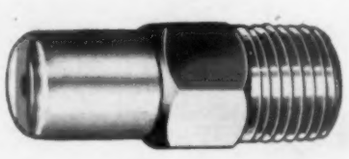
The Goodrich method of splicing conveyor belting produces the same flexibility at the splice as in the rest of the belt. The vulcanized splice, giving a smooth, permanent joint without metallic fasteners is easier on the idlers, idler bearings and terminal pulleys.

Joints with metallic fasteners, through repeated contacts with idlers and take-up pulleys frequently become loosened and must be replaced. Vulcanized joints provide a continuous waterproof surface, prevent ply ends from soaking up moisture and eliminate the rust streaks often caused by metal fasteners.

● Tractor-Loader

The new MobiLoader, a product of the Athey Truss Wheel Company, Chicago, should have many applications in the quarry field. It is a product of two years of development and research and in addition to many other uses, is designed for stock-pile loading and sand-and-gravel plants, and a wide variety of industrial plant uses.

The MobiLoader, shown at the recent Road Show, has a 1½ cubic-yard bucket. There is 7½ feet of clearance under the chute for rear dumping. For front dumping the load can be discharged at any point from the ground to a height of 7½ feet. It is cable operated and



The above illustration shows a flat-spray nozzle just placed on the market by the Spraying Systems Company, Chicago. The spray is of the flat type with slightly heavy center and can be had in a number of different spray angles. Nozzles have a ¼ inch male pipe connection. Capacities range from 1.5 to 3.5 g.p.m. at 10 pounds pressure and 3 to 7 g.p.m. at 40 pounds pressure.

WILLIAMS LEADS IN WELDED BUCKET CONSTRUCTION

Williams Buckets have always featured more welding in bucket construction than any other manufacturer.

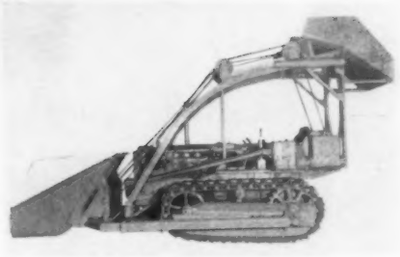
NOW, IN THE NEW 1940 LINE OF WILLIAMS BUCKETS, welded rolled steel construction is utilized in every feasible part. Sections which take the hardest blows or endure the greatest wear are built up by welding in special alloy steels.

STRONGER! LESS BREAKAGE! LESS WEAR!

Williams Buckets and parts are carried in stock for prompt deliveries and service by distributors in all parts of the country.

THE WELLMAN ENGINEERING CO.
7014 CENTRAL AVE., CLEVELAND, OHIO

WILLIAMS Buckets built by WELLMAN



Clear-vision tractor-loader.

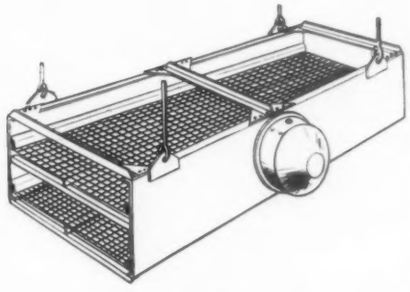
power is transmitted from a front power take-off to a worm-gear transmission unit mounted on the left-hand fender of the tractor. Rear dumping is controlled by one lever within easy reach of the tractor operator. In front dumping a trip lever dumps the bucket forward.

An outstanding advantage of the Mobi-Loader is that it allows clear vision for the operator, since there is no structure in front of the driver to obstruct his view. In addition, the MobiLoader does not interfere with the operation of the tractor tracks, but leaves them free to oscillate normally.

The drawbar of the tractor is left clear to allow the use of the tractor for other purposes, or for mounting the winch. The bucket is easily removed when the tractor is employed for uses other than loading.

• Screen

The new Gyroset vibrating screen receives its action through the use of compound-eccentric balance wheels. Vibration amplitude so intensity is not only adjustable but is also positive, so the machine is not affected by load and the action is uniform and constant whether



The new vibrating screen.

the feed is 10 pounds or 300 pounds. The eight complete throw adjustments (from 0 to ⅛ inch) are easily made. No special tools or skill are required.

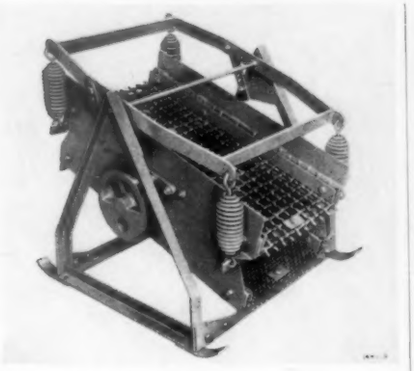
The full-floating shaft is not subjected to radial load stress. The vibrator assembly is completely inclosed and all moving parts operate in a continuous bath of oil. Moving parts are inclosed, no wheels to catch hands or clothing of the operator. Screen cloths are easily and quickly changed.

The screen is manufactured by the Productive Equipment Corporation of Chicago.

• Screen

A small, light, portable, double-deck vibrating screen that will make separation of crushed stone, gravel, or sand into three sizes at about 100 tons per day has been announced by the Robins Conveying Belt Company of New York.

It is driven at 1,000 r.p.m. by a 2-horsepower gasoline engine or a 1-horse-power electric motor. The width of the screening surface is 16 inches and the length 36 inches.



Small, lightweight vibrating screen.

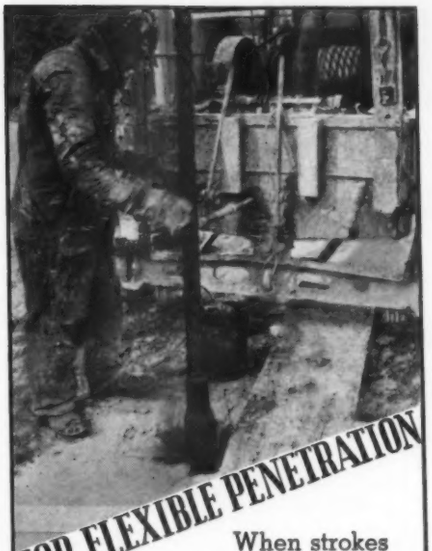
The total weight is less than 400 pounds. Its uses are for roadside plants, building construction, separation of sand for concrete blocks, bridge abutments, foundations, or other concrete work. It is equally effective for the sizing of cinders, coke, coal or any other bulk material.

The total cost of operation and maintenance, including interest on investment and depreciation, is said to be less than ¾ of a cent per ton of material produced.

• Vibrator

The Syntron Company, 385 Lexington Avenue, Homer City, Pennsylvania, has just added to its line of vibrators, an "explosion-proof" model, for use in plants where atmospheric conditions are highly inflammable or explosive.

The vibrator, a heavy, pulsating electromagnet, is fully encased in a thick, electric-



FOR FLEXIBLE PENETRATION

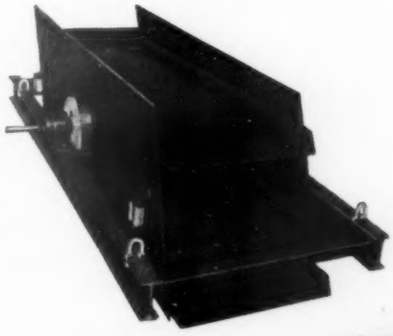
When strokes per minute mean dollars earned per hour — Safeguard expensive equipment from costly shut-downs with FITLER "Philadelphia" Manila Drilling Cable.

Look for the Blue and Yellow Colored Yarn Trademark

DRILLING CABLE

THE EDWIN H. FITLER CO.
PHILADELPHIA, PA.
Established 1804

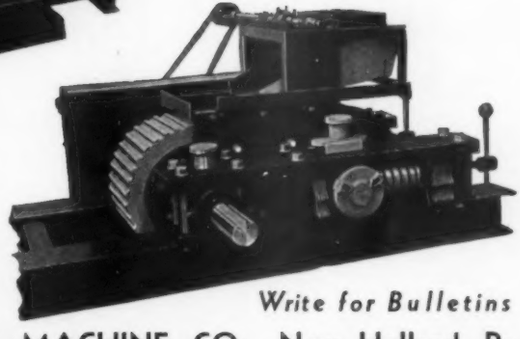
NEW HOLLAND CIRCLE THROW SCREENS
Strike Out High Grading Costs
EVERY TIME!



New "CIRCLE THROW" action has plenty "on the ball"—lowers batting average of grading costs to bush league figures. Increases **quality** production of sand, gravel, aggregates. Full line of sizes.

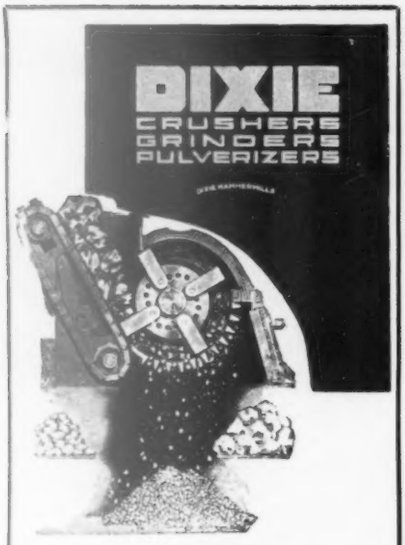
This Roll Crusher likes *tough* opposition

A New Holland Roll Crusher reduces any rock material to required fineness at high rates of capacity. Output is doubled by patented pulsating feeder. Sizes for any production up to 100 tons per hour.



Write for Bulletins

NEW HOLLAND MACHINE CO., New Holland, Pa.



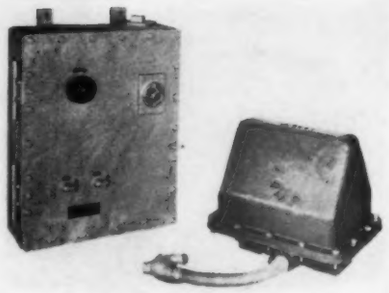
in 1940 . . . .
. . . . in Any Year

Let Dixie Non-Clogging Hammermills Point the Way Toward:

- Longer Life
- Lower Costs
- Greater Profits
- High Capacity

Built in 40 sizes for a full range of reduction. Capacities to handle any type of material. Write for your copy of the DIXIE Catalog TODAY!

DIXIE
MACHINERY
MFG. CO.
4310 GOODFELLOW AVE.
ST. LOUIS



Vibrator and control box.

furnace steel case, with ground joints, and with an armored cable lead.

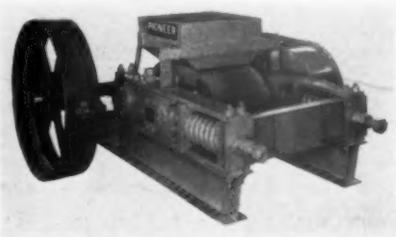
The remote electric control panel containing a rectifier, operating switches and rheostat for controlling the vibrator's power, is fully encased in a cast iron case, with ground joints and approved explosion-proof fittings.

These Vibrators are used for attachment to bins, hoppers, chutes, etc., to prevent arching over and hanging up of material, and to insure a free flow at all times.

• Crusher

The Pioneer Engineering Works, Minneapolis, recently added a new roll crusher to its line. The new machine has rolls 16 inches in diameter, with a 16-inch face, which gives the Pioneer company a complete range of sizes from 16 up to 54 inches in diameter.

The new crusher is offered with either bronze bearings or Timken bearings. One of



Corrugated-roll crusher.

the important new features of the bronze-bearing crusher is that the bearings are inclosed and protected from dust, just like anti-friction bearings.

The crusher is equipped with fine corrugated rolls which will produce small materials, but still have a large "bite." The shells are manganese steel and are replaceable. The crusher is gear-driven, all gears located on one side of the crusher and fully enclosed.

• Wool-Batt Holder

The rock-wool department of the Reardon Cement Company, Cincinnati, known as the Reardon Insulation Company has developed a new method of holding rock-wool batts in position in buildings.

Instead of the wool being held in position by paper supports, the Reardon method consists of an adjustable steel tie anchored at intervals inside the wood studs and tightly binding the wool in place. These ties or snaps are effective regardless of the spacing of the studs—whereas with paper ties the studs must be absolutely uniform.

These special ties are so designed that their cost is negligible. They are sprung into position between studs—without tools or nails. This method permits a permanent air space between the wool and the plaster on an outside wall to avoid condensation.

The Model
"135" LOADER

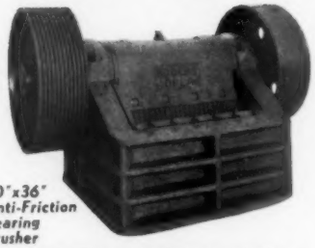
is the fastest loading machine within $5,000 of its price, as well as heaviest, strongest and most powerful Loader built. It competes with BIG equipment. On a cost-per-yard basis, it's all alone. *Bulletin 134*

WRITE, WIRE OR TELEPHONE
HAISS
George Haiss Mfg. Co., Inc., 142nd & Rider Ave., New York

Who, for nearly half a century, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Portable Conveyors—Revolving Screens

ROGERS CRUSHERS
Are Good Crushers



10"x36" Anti-Friction Bearing Crusher

DEPENDABILITY +
RECORD PRODUCTION
= REDUCED COSTS!

—reasons why many users standardize on

ROGERS CRUSHING EQUIPMENT 100%!

Jaw Crushers • Crushing Rolls
Elevators • Conveyors • Screens
Complete Portable or Stationary
Gravel or Quarry Plants

ROGERS IRON WORKS CO.

Write for Bulletins Nos. 303 and 304
300-10th St.
CRUSHER BUILDERS FOR 40 YEARS
Give Us Details of Your Crushing Problems
JOPLIN, MO.

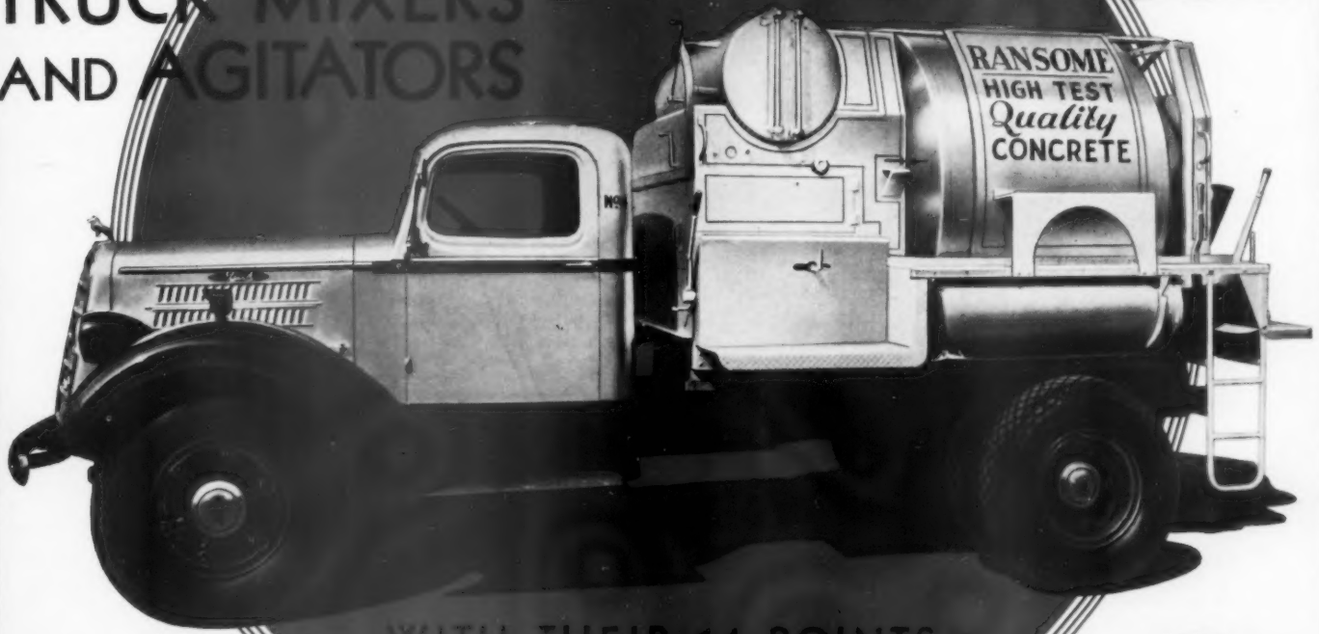
The CONCRETE MANUFACTURER

A Special Section of ... CONCRETE PRODUCTS

America's finest

Ransome

TRUCK MIXERS AND AGITATORS



WITH THEIR 14 POINTS
PLUS OUTSTANDING FEATURES

SEND FOR LATEST BULLETIN

RANSOME CONCRETE MACHINERY COMPANY

DUNELLEN Cable Address: "RACOMACO" Dunellen NEW JERSEY

The CONCRETE MANUFACTURER

March, 1940

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

Published by Pit and Quarry Publications
538 South Clark St. Chicago

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Assistant Editor:
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 9357
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 430, 122 East 42nd St.
Telephone CALedonia 5-4438
New York, N. Y.

Central Advertising Manager:
W. H. SANDERSON
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

Advertising Representatives:
D. R. EGBERT
Chicago, Ill.

W. H. GRUBBS
Western Pacific Bldg.
Telephone Prospect 3746
Los Angeles, Cal.

DUNCAN A. SCOTT & CO.
Mills Bldg.
Telephone Sutter 1393
San Francisco, Cal.

Field Representatives:
A. C. PETERSEN
J. K. GARESCHE

Joist Manufacture and Recommendations for Use in Concrete Floors Revealed in Report

An interesting report on precast joist concrete floor systems appears in the January, 1940 issue of the *Journal of the American Concrete Institute* (pages 297 to 312), prepared by F. N. Menefee, chairman of the Institute's Committee 711.

An analysis of manufacturing methods shows that nearly all joist producers are using high-early-strength cement to hasten hardening and get the joists out of the forms as quickly as possible. Many are employing manufactured lightweight aggregates, either entirely or mixed with gravel or crushed stone. Mixtures range from 1:1¼:1½ to 1:2½:2½ by volume, the average being approximately 1:2:2. Water content per sack of cement varies from 4 to 7 gallons, few producers use admixtures, all vibrate the materials in the forms with one exception where rolling pressure is employed to compact the concrete. Low-pressure-steam curing is general practice.

Joists are usually stored standing on edge and instructions are issued to handlers regarding the proper way to carry them. Where the shear loops do not protrude, the tops of the joists are marked in some other way.

The report concludes as follows:

"On every job there will be a need for a joist-setting plan prepared by an architect or an engineer and approved by the manufacturer. Only in this way will the owner be assured of unquestionable results. Shears and bending moments will be properly taken into account by the architect or engineer and the manufacturer becomes a party to the transaction. His supervision over the placing of reinforcement and the treatment of the joist from planning the mixture to delivery on the job will have greater attention and advantage if his advice may be had.

"There is a need for standardization of many installation and construction details. This does not mean that innovations should be prohibited or frowned upon, but rather that an acceptable practice in handling and setting, leveling, shoring of joists, placing forms for floors, reinforcement for floors, conduits, bulkheads, stairwells, partition bearing joist, etc., should be approved and the architect, engineer, manufacturer and building contractor be informed. . . .

"Research in connection with precast floor systems should be continued; some of the as yet unanswered questions could be settled by the following tests:

1. Tests under dynamic conditions such as repeated loadings at 1½ times the design load; this test should be run on floor slabs exactly alike in dimensions but of three types—a. Monolithic, b. Precast joist-cast-in-place concrete floor slabs, c. Precast joist-precast slabs.
2. Tests on comparative distribution of loads as between the job placed floor and the precast slab.
3. Tests or studies as to the desirability of placing a camber in the joist; in both Type 1 and Type 2 floors.

■

Company Changes Name

Announcement was made recently by the Concrete Pipe Company, Seattle, that since January 1, 1940 it has been carrying on operations under the name "Graystone Concrete Products Company." F. M. Kettenring, president of the concern stated that no change in the operations or policy of the company was involved. "Graystone Products" has been the trade name under which this company's products have been marketed for many years. The new name was adopted because of recent expansion of the operations to include all lines of concrete building materials such as brick and hollow tile.

The Graystone Concrete Products Company is Seattle's oldest and largest manufacturer of concrete products. Established in 1919 on the Lake Washington Canal, just west of the Fremont Bridge, the then Concrete Pipe Company has been in continual operation manufacturing concrete pipe for sewer and culvert developments. During the last ten years, under the leadership of W. F. Paddock, the Concrete Pipe Company has become nationally known as one of the leading firms in the industry. Recent contracts involved the manufacture of many miles of reinforced concrete pipe for trunk sewer systems in and around Seattle.

Homer Bergren, now secretary of the company, and Mr. Kettenring, became associated with Mr. Paddock in 1934.

The joist-manufacturing operations viewed from the concrete plant. The stationary mixer and a truck-mixer are in foreground.

Making Precast Concrete Joists by Continuous Production Methods

By W. E. TRAUFFER

THE manufacture of pre-cast concrete joists is a subject which is being given much thought these days by concrete-products manufacturers and others serving the building industries. Many have already gone into the manufacture of these joists and an even greater number are actively interested.

Most precast joists are now being made by standardized methods involving the use of a vibrating table and a set of forms. Usually it is considered inadvisable to remove the completed joists in their forms from the tables until they have been allowed to set for at least 12 hours. By this method the capacity of one table and set of forms is limited to from 6 to 10 joists daily or whatever number of forms the table can accommodate at one time. For this reason a continuous production method developed on the Pacific Coast should certainly be of interest.

This method was developed by the Concrete Products Division of Graham Brothers, Inc., Los Angeles, California, one of the largest and most progressive producers of sand and gravel and ready-mixed concrete in the West.

It involves the use of a special vibrating table and a very rich dry mix. The units are removed from the forms immediately after they are made. As many as 140 3- by 8-inch floor joists have been made in an 8-hour day. The average daily capacity is about 2,400 lineal feet of 20-foot joists or 600 lineal feet of 8- by 12-inch girders and struts.

In the Los Angeles area termites have become a serious problem and ways and means of checking the ravages of these pests have been the subject of much study and experimentation. Few homes in this section have basements and one of the many substitutes which were tried to replace the common wooden construction are concrete subfloors on ground level. These proved to be too moist for comfort and it was impossible to keep wooden flooring on them. This resulted in a trend toward pan-type concrete slabs with an air space under them. This type of construction proved satisfactory but was much too expensive for the average home owner.

The most approved type of construction now involves the use of precast concrete joists with a 2½-inch poured slab on which the floor surface is laid, a type of construction which is actively endorsed and widely advertised by the Portland Cement Association. Graham Brothers, Incorporated, was among the first in this area to realize the advantages of this type of construction and its importance as an additional outlet for aggregates and concrete. Early in 1938 the manufacture of precast concrete joists was begun on a small scale at an experimental plant at its Fowler Avenue yard. The process employed was perfected there before construction was begun of the present plant at 2700 South Soto Street, which went into operation in September, 1939. Precast joists have already been supplied for over 60 houses, a hospital, apartment and business buildings, a storage vault, etc.

This plant and process were developed primarily to furnish joists for buildings with floor loadings of less than 125 pounds per square foot. These include residences, slum-clearing projects, apartments, hospitals, schools, small business buildings, etc. The company also designs and makes special units for heavier loadings. The fact that this type of construction is available at prices comparable to those of wood-frame construction treated for termite-resistance has helped to popularize it. Before manufacture of the standard joists got well under way, however, a contract was obtained to manufacture precast girders, purlins and struts for a 3.9-acre reservoir for the city of Ventura. This job called for over 3,000 pieces from 17 to 20 feet long. Included were 3- by 8-inch purlins, 8- by

A section of joists and floor slab which was exhibited recently at the Los Angeles County Fair at Pomona, California.

A series of five photographs illustrating the manufacture of the joists. Above: The reinforcing steel being put in place. Above right: Concrete being poured into forms. Right center: Steel hangers being placed. Right bottom: Finished units on their pallets being withdrawn from the forms. Below: Another view of finished units being removed from forms.

12-inch girders, and 8- by 12-inch struts. These units were made and hauled 75 miles to Ventura at a lower cost than if they had been made on the job. The 12-inch and 14-inch square concrete columns used on this project were made at the site.

As business of this type could be developed into a profitable side-line in many other sections of the country, a brief case history of this job is given. The city of Ventura was faced with the problem of roofing over this 3.9-acre reservoir with a permanent structure and had only a limited amount of money available for this purpose. Cost data were compiled for the three types of construction available: wood, cast-in-place concrete, and pre-cast concrete. Preliminary estimates showed that cast-in-place concrete would cost about 50

View of the yard showing crane with ready-mixed-concrete plant in background.

per cent. more than precast concrete. Wood, with a definitely limited life, would cost about three-fourths as much. Pre-cast concrete was selected because it cost little more than wood and was as nearly permanent as cast-in-place concrete. Members of the Graham organization hold that just as ready-mixed concrete has many advantages over job-mixed concrete, so precast concrete joists have advantages over other forms of concrete construction. In their manufacture the placing of the concrete is done under convenient working conditions in which reinforcing steel can be precisely placed and the concrete poured without the formation of rock pockets caused by segregation of the aggregates. In commercial manufacture the intensity of vibration makes it possible to use a concrete with very little slump, which could not be successfully poured on the job.

At the Soto Street plant the concrete for standard units is mixed by an old 1-cubic yard paver which has been enlarged to 1½-cubic yard capacity. The concrete is discharged into a 1½-cubic yard drum-shaped bucket which is mounted on a pivot so that the opening can be turned upward for loading and downward for discharging. This bucket is placed on a car running on rails along the top of the vibrating table. The table is also mounted on rails placed at right angles to its length. Concrete is discharged from the bucket into the forms as it is pushed from one end of the table to the other, the lip of the bucket acting as a spreader.

The mixer and bucket hold sufficient concrete for the pouring of a complete batch of any of the four standard-sized joists. Ten 3- by 8-inch or 3- by 10-inch joists or eight 4- by 12-inch joists can be made at one time. For the Ventura job four 8- by 12-inch struts and girders were made at once. The mixer and bucket did not have capacity sufficient for pouring these from one batch as the specifications required. so ready-mixed concrete was used. This concrete was brought in mixer trucks from the company's modern concrete-batching plant on the same property and was discharged on the concrete floor of the table runway from which it was shoveled into the forms.

The vibrating table is of original design and merits a little better description. The bed, or cradle, is vibrated by means of two unbalanced rotating shafts, one on each end. The shafts are mounted on a beam, which is suspended by rubber supports from the bed, so that the top of the beam just touches cross braces attached to the under side of the bed. The entire system is mounted on springs to prevent the transmission of vibration to the wheeled carriage.

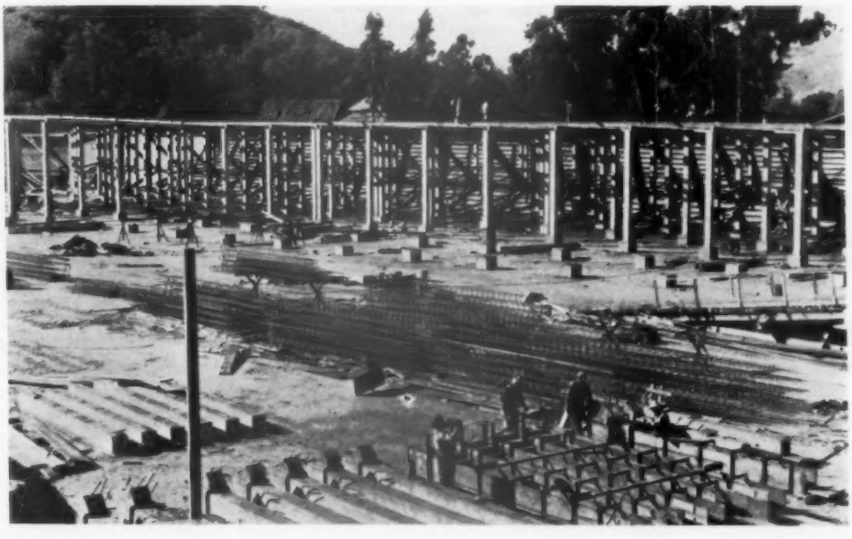
The form system consists of two side plates and the required number of intermediate plates with bottom separators or pallets of steel channels. With this system the same set of 8-, 10- or 12-inch forms can be used for units of any desired width. Three-inch and 4-inch pallets are used singly or in combination for the wider units. The forms are 25 feet and the pallets 27 feet in length. Screws, placed every 5 feet on one side, tighten up the system by the turning of a single crank. Wooden end blocks are used and the lengths are kept within 1 inch.

The locomotive crane used to stack joists and other products for curing and shipment.

In operation the first step is the placing of the reinforcing, which consists of bars and stirrups for the smaller units and pre-fabricated cages for the larger ones. Straight steel can, if desired, be allowed to protrude through the end blocks. Wire chairs hold the reinforcing in the proper position. The concrete is then placed, and the table is vibrated for at least 5 minutes during and after the pouring. The top is then screeded off and the anchors, if required, are placed. The bed is then again vibrated for a short period.

After the operation is completed the table is rolled from its loading position at the mixer to the desired position for

(Continued on page 82)



A view showing work partially completed at the Ventura reservoir. Some of the concrete columns used are being made in the foreground.

Nation's Concrete-Products Makers Assemble for Annual Convention

THE anunal meetings of the National Concrete Masonry Association and the Cast Stone Institute, held concurrently February 12 to 14 at the Mayflower Hotel in Washington, drew an interested attendance of nearly 500 producers and manufacturers. For the first time in recent years no equipment exposition was held and the American Concrete Contractors' Association's annual meeting was not held in conjunction. As a result those present came primarily for the information they could obtain at the convention sessions. All the meetings were well attended and those present were well repaid for their time and expense in going to Washington.

The new president of the National Concrete Masonry Association is Roy N. McCandless, Cinder Block, Inc., Detroit. Harve E. Kilmer, retiring president, is now chairman of the board. Ray Berger, Martin Berger Cement Block Company, Detroit, was made a director, replacing George H. Krier, Nailable Cinder Block Corporation, Brooklyn, New York. All the other officers and directors were reëlected. E. W. Dienhart, Portland Cement Association, continues as assistant secretary.

The Cast Stone Institute reëlected M. A. Arnold, Arnold Stone Company, Greensboro, North Carolina, as its president. All the other officers were also reëlected as were all the directors with one exception. The new director is N. D. Harter, Marblecrete Stone Company, Oklahoma City. C. G. Walker, Portland Cement Association, continues as assistant secretary.

This comparatively small but very aggressive group held three independent morning meetings, one afternoon meeting, and a joint evening meeting. There was also an inspection trip on which those in attendance visited producing plants and jobs on which cast stone was being used. Scheduled meetings were to have closed at noon Wednesday, but interest in the subjects discussed was so great that it was voted to continue the meeting on into the afternoon.

Strengths and weaknesses in the manufacture and merchandising of cast stone were analyzed and remedies suggested. And a drama which touched the heart of everyone was presented when M. A. (Max) Arnold, vainly tried to refuse the nomination for the presidency for the coming year because of ill health and pressing personal business, and for an hour members beseeched him to continue as their leader, promising to lighten his burdens if he would continue to lead. This was immediately followed by presentation of a beautiful wrist watch to "Gil" Walker of the Portland Cement Association for the work he did. It rendered Gil speechless.

The main theme of the convention was the reëstablishment of cast stone in the confidence of buyers. Because a few companies in the past have clipped corners on specifications, cast stone has fallen into some disrepute. Two methods were suggested to restore confidence and win back acceptance. One is to accept a clause in contracts providing a stiff penalty if material and reinforcing specifications are not adhered to, and the other is to furnish a bond guaranteeing that the purchaser will get what he pays for. The latter will cost only ¾ of one per cent. President Arnold appointed a committee to go into these methods and it will report to the membership by mail during the year.

Another point that brought much discussion was the reinforcing of cast stone. It was agreed that architects and contractors specify too many reinforcing bars of too great a thickness, where the reinforcing is for handling purposes only and no weight is to be placed on the concrete in the finished structure. It was also agreed that too much reinforcing is specified for weight-bearing concrete. In using too much steel cast stone can be actually weakened, because of too small space for the concrete and the possibility of the steel rusting. Costs can be kept down, and thus more stone sold if less steel is used.

Tuesday morning Otto Buehner, Otto Buehner Company, Salt Lake City, Utah, presented a report of laboratory studies of integral and surface waterproofings conducted by the institute since 1938. The investigation promises to contribute many advances in the technique of waterproofing cast stone.

One of the most interesting papers of the convention was presented by R. S. Phillips, concrete technician of the Portland Cement Association. He emphasized the necessity of getting back to fundamentals in the making of concrete. Clean aggregates of the proper sizes, proper amounts of water, and the importance of curing methods were mentioned. The ensuing discussion occupied the rest of the morning.

The Tuesday afternon meeting of the Cast Stone Institute included a round-table discussion on the use of elastic pointing compounds. All those present seemed to agree that a perfect compound is not yet in existence and many gave their experiences with compounds now on the market. M. A. Arnold said

that his company furnishes the compound with all the stone sold and does all the cleaning, calking and waterproofing. This procedure, he said, costs money but is the best investment his company has ever made. Others present cited similar experiences indicating the desirability of having control over the calking and pointing of cast stone whch may shrink for some time after it is made and put in place.

The welcoming address at the Monday morning meeting of the masonry association, by a member of the local board of commissioners, brought out the fact that Washington in 1939 used more concrete masonry than any other city and was third in building volume.

The Work of the Cement Products Bureau of the Portland Cement Association was described by W. G. (Bill) Kaiser, manager of the bureau. He recounted the growth of the industry and the improvement in the quality of its products. The increasing acceptance of concrete masonry in building codes is gratifying, he said, but much work is needed along these lines.

Mr. Kaiser also reviewed the lowering of fire-insurance rates, the inclusion of concrete masonry in A.S.T.M. specifications, the introduction of light-weight aggregates 20 years ago. He also mentioned the work of the association's Question and Answer Bureau, the Concrete House Program, and the association's advertising, which has brought in several hundred thousand inquiries in a few years' time. Another important phase of this work, said Mr. Kaiser, is convincing bankers, insurance companies, and other large investors, that concrete houses are a good investment. The result, he said, is a growing belief among bankers that a poorly-built house is a bad mortgage risk.

Mr. Kaiser also described some of the many other ways in which the association is promoting the use of concrete masonry. Among these was an architectural competition in which the 55 winning plans were published. In closing he said that the 1939 volume of production was ⅓ higher than that of 1938. The total production was the equivalent of 234,000,000 standard blocks, the largest in recent years. An increase over this figure was predicted for 1940.

Harve E. Kilmer spoke on *The National Concrete Masonry Association—Its Field of Usefulness to the Industry.* He told of the need for coöperation among producers, through the association and in other ways. All producers, he feels, should be constantly working for the recognition of the superiority of concrete masonry among architects, engineers, contractors, etc., as the association is doing. The association, he said, helps the members to solve both operating and merchandising problems. It also distributes promotional literature which few producers alone could afford to do. He mentioned the assistance the association has received from the Portland Cement Association in carrying on its work.

The Monday afternoon meeting, devoted to research problems, was held at the U. S. Bureau of Standards. Director Dr. Lyman J. Briggs of the Bureau welcomed the assemblage and then briefly reviewed the investigations made which have been of value to concrete-masonry producers.

Loads on Building Walls and the Strength of Concrete Masonry Walls was the subject of a discourse by Dr. A. H. Stang, senior engineer of the bureau. He went into some detail on the tests mentioned by Dr. Briggs. He also used a diagram to illustrate the loads on roof, floor and wall caused by snow, wind, live loads, etc.

D. E. Parsons, chief of the Masonry Construction Section of the Bureau, told of a study started four years ago of the *Water-Permeability of Concrete-Masonry Walls.* He demonstrated the apparatus used in making permeability tests and showed the importance of good workmanship and various systems of laying on the water-tightness of a wall. A wide range was found in results obtained and joints were found to be the vital point. According to Mr. Parsons, ordinary blocks need some kind of facing to keep out moisture and, he pointed out, joints form a weak point even if the blocks are waterproofed. Cement paint, he said, is good, but a high-grade stucco gives even better results.

Paints for Exterior Finishing of Concrete Masonry Walls were described by Mrs. Clara Sentel, assistant chemist, in the paint section of the bureau. A cement paint, she said, should be tough, flexible, adherent, durable and waterproof. She then described four types of paint now available and their characteristics and made suggestions on how to use them. According to Mrs. Sentel, painting exterior concrete is no more difficult than painting wood if reasonable care is exercised.

S. H. Ingberg, chief of the fire resistance section of the bureau reviewed the history and development of masonry especially with respect to its fire-resisting qualities. Its use was first confined to exterior walls, then it was extended to first floors, etc. He also discussed the sound and heat-insulation qualities, lower up-keep and other characteristics.

Following this meeting the producers assembled outdoors for a group photograph and then witnessed a fire test of a concrete-masonry wall.

The National Concrete Masonry Association and the Cast Stone Institute held a joint session Monday night which was devoted chiefly to a discussion of precast concrete floors. Ralph Condo, James Condo & Son, Somerville, New Jersey, described *A New Type of Precast Concrete Floor—Tee Sections are Used for Joist and Floor Slab or Joist and Ceiling Slab.* Acording to him, a machine has been designed and patented to make this product. While his plant is not yet in full production, slides illustrated the method of manufacture and the use of the product.

H. L. Rogers, manager, Flexicore Division, Price Brothers Company, Dayton, described *The Flexicore Method of Precast Concrete Floor Construction.* An interesting point brought out was

N. D. Harter (Marblecrete Stone Co., Oklahoma City), new Cast Stone Institute director, M. A. Arnold (Arnold Stone Co., Greensboro), reëlected president, and Otto Formigli (Formigli Corp., Philadelphia).

also cut on this machine. Holes are drilled in the blocks and joists with a Carboroid drill.

Increasing the Speed of Curing Precast Concrete Joists Through the Use of Electricity was explained to the audience by Joseph Nagy, Columbia Block and Supply Company, Toledo. His company formerly used salamanders in cold weather and stripped the joists at from 10 hours upward. The electric heating system now used cost only $97.00 to make. General Electric soil cable is used. The current is 220-v., and 40 watts is required per foot of joist. The recommended temperature is about 160 deg. F. Stripping can be done after 5 hours. The electrical cost of curing, according to Mr. Nagy, is 3.2 cents per 20 feet of joists.

The meeting on Tuesday morning was labeled a promotional session but actually it was more than that. It was

the fact that the tension steel in the bottom of the unit is pre-stressed when it is poured. This gives the cured joist a slight upward bow which becomes level under dead load in a finished building. According to Mr. Rogers, a number of companies are now making Flexicore joists which are sold either in place or at the plant.

A paper which attracted much interest was *Stocking Precast Concrete Joists and Cutting to Required Length is Now Practical* by Dave Warsaw, Hay-Con Tile Company, Detroit. According to the speaker, the time necessary for properly curing joists is one of the biggest handicaps in selling this product. Many builders want joists of certain sizes and lengths at once and do not want to wait for them to be made to order and cured. On the other hand a

F. E. Milewski (W. E. Dunn Mfg. Co.); Paul Formigli (Formigli Corp., Philadelphia), reëlected secretary-treasurer of the Cast Stone Institute; W. G. Kaiser, Portland Cement Assn.

J. A. Callahan (Gravel Products Corp., Tonawanda, N. Y.), a regular attendant at these conventions.

producer can not afford to carry in stock a line of joists large enough to meet all possible demands.

According to Mr. Warsaw the solution of this problem lies in stocking only enough joists to meet reasonable demands and cutting them to the desired lengths on order. This method makes quick deliveries possible and enables the joist manufacturer to compete with the producers of wood and steel. His company stocks joists from 8 feet 8 inches to 16 feet 8 inches in length. He then described the company's experiences in developing a satisfactory method for cutting these reinforced-concrete joists. At first cold chisels and hack saws and other methods were tried and found wanting. Finally a swing cut-off saw was installed. Different types of Carborundum wheels were tried until one was found which combined toughness with wear resistance. Now 8-inch joists are cut in a few seconds. Blocks are

a clear-cut demonstration to those present of the importance of government-financed and government-aided housing as a market for concrete masonry. The various speakers ably pointed out the market and demonstrated how this business could be obtained.

First came a motion picture—*Housing in Our Time*—prepared by the U. S. Housing Authority. This picture showed some of the many housing projects which have been built by the government and some of the private dwellings financed by it. Comment was also made on the part concrete masonry is playing in this construction.

Concrete Houses Must Be Made an Attractive Package to Command Public Acceptance was the subject of an illustrated talk by A. H. Wagner, Portland Cement Association, Philadelphia. Mr. Wagner described the growing demand for the latest conveniences by home buyers and the progressively

Roy N. McCandless (Cinder Block, Inc., Detroit), new president of the National Concrete Masonry Assn.; Benjamin Wilk (Standard Building Products Corp., Detroit), a past president; Fred W. Reinhold (Anchor Concrete Products Co., Inc., Buffalo), a director.

lower costs at which architects and contractors are being forced to provide them. This trend, he said, is due to the more intelligent buying now being done This is creating a growing demand for concrete masonry houses.

Motion pictures showed several private housing projects in suburban Philadelphia which have met with great success. These were started through the coöperative efforts of real-estate firms, builders, architects, products manufacturers and government lending agencies. In one subdivision over 150 con-

Frank Muenzer (Multiplex Concrete Machinery Co.), and W. W. Warren (Missouri Portland Cement Co.)

crete-masonry houses have already been sold and in another 110 sales have been made. Now 15 such coöperative groups are operating in the state of Pennsylvania and others are being formed.

This method and the types of houses being built have been widely copied throughout the nation, according to Mr. Wagner. In some of these projects where the type of building material used is optional most buyers selected concrete masonry with Portland cement paint in preference to clay bricks backed up with concrete masonry. This picture also showed one of the first concrete-masonry houses built in Philadelphia. This building has not been repainted since it was erected in 1919 but still has an attractive appearance and does not leak.

Nathan Straus, Administrator, U. S. Housing Authority, spoke on *What the U.S.H.A. Housing Program Means to the Building Industry*. He said that the program aims at the lowest income group and that some families with incomes of less than $300 annually live in the completed projects. The private building industry, according to Mr. Straus, aims chiefly at the top third income group and a little at the middle group but not at all at the lowest group under $900 annually. The top income group has neared its saturation point as far as building is concerned and future business must come from the middle and, perhaps, also the lower groups.

Mr. Straus expressed his opinion that government housing should not go out of the lower group. He urged the producers to get this business.

He then gave some statistics on the progress of the U.S.H.A. program and its effect in eliminating slums and blighted areas. The social benefits of this program, he said, are well known but not so the economic benefits. Most of the money spent, according to him, goes to private industry, for land, building, materials, etc. Local labor is also benefited. These projects, he said, are also proving grounds for new techniques for better and more economical construction of private buildings.

The many questions asked of the speaker indicated the interest in this subject. These brought out the fact that the U.S.H.A. act required that one vacated dwelling must be demolished or repaired for each new unit built and that this must be done within two years after the completion of the project. This provision is an iron-clad part of the agreement with the local housing authority and must be approved by the city council. In the last year, he said, 80 per cent. of such buildings were demolished to prevent re-occupation and only 20 per cent. were repaired. Another question brought out the fact that the number of persons occupying a given amount of space is limited to prevent overcrowding.

The Federal Home Loan Bank Plan for Insuring Quality Construction for Residences was described by John H. Fahey, chairman, Federal Home Loan Bank Board, Washington. He reviewed the formation in 1932 of the 12 regional banks with a capitalization of $125,000,000. Many facts and statistics on this organization, the H.O.L.C., were given. In closing the speaker urged the whole-

John S. Bailey (Concrete Manufacturing Co., Atlanta), T. W. Noble (Thomas W. Noble Co., Chicago), Harve E. Kilmer (Iowa Concrete Crib and Silo Co., Des Moines), retiring president of the N.C.M.A. and new chairman of the board of directors, Gene Olsen (Stearns Mfg. Co.)

Paul H. Woodworth (Portland Cement Assn.), Earl A. Soloman (Pennsylvania-Dixie Cement Corp.), A. G. Streblow (Basalt Rock Co., Napa, Cal.)

hearted coöperation of the industry in making available better homes for the amount of money spent.

In the absence of Stewart McDonald, Administrator, Federal Housing Administration, his subject, *Adjusting Housing to its Market,* was covered by Richard R. Gay.

While others attending the convention were out seeing Mount Vernon on Tuesday afternoon, members of the National Cinder Concrete Products Association held a meeting. The first speaker described the progress made on the specifications being developed by the association. This specification, he said, will be all-inclusive and definitely describes testing procedure without reference to any other specifications. It holds the manufacturer to closer limits than any other existing specification and places definite limits on all qualities, characteristics, ingredients, etc. The members present unanimously adopted the specifications as written. A committee was appointed to write a manual on the manufacture of cinder-concrete blocks.

There was also some discussion of the *News,* an informative and promotional publication of the association which is distributed to lists of prospective purchasers furnished by members.

The meeting of the masonry association Wednesday morning was a manufacturing session. Paul M. Woodworth, Portland Cement Association, was the first speaker and his subject was *The Concrete-Masonry Industry Tests Its Products for Strength and Durability. Tests Made at the University of Wisconsin—How to Interpret the Results and Apply Them to Plant Practice.* As a comprehensive digest of this paper was published in the December, 1939 issue of PIT AND QUARRY readers are referred to that number for particulars.

In the absence of W. E. Barney, Hydraulic Press Brick Company, Cleveland, E. W. Dienhart of the Portland Cement Association read his paper on *A New Type of Curing to Reduce Moisture Content of Concrete Masonry Units—The Use of Forced Air is a Promising New Development to Overcome the Problem of Volume Change.* Briefly, this method consists of piling the blocks with air spaces below them. Horizontal flues at ground level conduct the air under the piles, whence it moves upward through the cores of the blocks. Air is supplied by a 25-inch fan with a 7½-horsepower motor which blows 2500 cubic feet of air per minute or about 1 cubic foot per minute for every block in the pile. This equipment is mounted on a hand truck and can be connected to the flues at various points. A 6-hour test made in warm weather resulted in an average loss of weight of 0.4 pound per block. Those blocks nearest the top of the pile lost 0.7 pound or 17 per cent. of their total absorption. Another 6-hour test made on the following day resulted in an additional average loss per block of 0.2 pound. According to Mr. Barney these tests were conducted spasmodically for several months and, in his opinion, the results warrant further study.

The next paper, *Study of the Handling and Stock-piling of Concrete-Masonry Units in the Plant and the Yard,* was presented by Ezra Clark, president, the Clark Tructractor Company, Battle Creek, Michigan. This paper was devoted chiefly to the application of this company's equipment to the concrete-masonry industry and was well illustrated. Excerpts from this paper will be published in PIT AND QUARRY.

The final paper of this session, *An Efficient and Inexpensive Covered Storage,* by A. L. Bowling, Cinder Block, Inc., Roanoke, Virginia, was followed by a round-table discussion of manufacturing and selling problems.

Graham Bros. (from page 77)

unloading. The side clamps are loosened and a yoke is attached to the ends of the pallets. The yoke is attached by cables to an electric hoist mounted on a car which travels on rails parallel to the rails on which the table moves. The finished units on their pallets are then drawn at one time from the forms onto supports on a temporary curing dock which is on the same level as the table bed and is large enough for a day's output. After a period varying from ½ to 1½ hours, depending on the weather, sprays are turned on and kept on overnight. In the morning a locomotive crane picks the units up, one batch at a time, and stacks them in piles for further spray-curing. Baffle sprays of the hot-house type with 1/16-inch openings are used. The standard joists can be shipped after 3 days, at the end of which time they exceed the designed 3,000-pound strength. At 28 days a strength of 7,000 pounds is reached.

For standard joists a 3½- to 4-sack mix with ½-inch maximum aggregate and low water content is used, and this, with the intense vibration, makes it possible to remove the joists from their forms as soon as they are made. The Ventura units were made with a water content of 3½ to 4 gallons per sack in a 7-sack mix, using high-early-strength cement in order to get maximum output. This resulted in a strength of 1,500 pounds in 20 hours and the units could be moved in 24 hours and shipped after a few days, at which time they reached the designed strength.

In loading joists for delivery the crane places the desired load of units on jacks and a flat-body truck is backed under them. The truck body is then raised, the jacks are removed, and the truck is driven off with its load. In unloading at the job this procedure is reversed. For the Ventura job the trucks used were equipped with cross-arms raised and lowered by hydraulically-operated pistons.

The development, operation and sale of precast-concrete joists have been under the direction of H. F. G. Pelsue, vice-president of the company. Don E. Davidson is plant superintendent. Sales are handled by the company's regular staff and every advantage is taken of the coöperation offered by the Portland Cement Association and much of the advertising literature used was prepared by the association. According to Mr. Pelsue, the manufacture of these joists has helped to sell ready-mixed concrete for foundations and slabs and fits in very well with their other lines. Concrete sidewalk blocks were recently added to the company's list of products and other additions are contemplated.

Modernistic radio-transmitter building at Pontiac built entirely of concrete masonry.

This Radio Transmitter-Station Required Blocks of 16 Shapes

BOICE BROTHERS COMPANY of Pontiac, Michigan, were confronted with an unusual situation recently when they agreed to furnish the concrete blocks for building radio-transmitter station WCAR located just outside Pontiac.

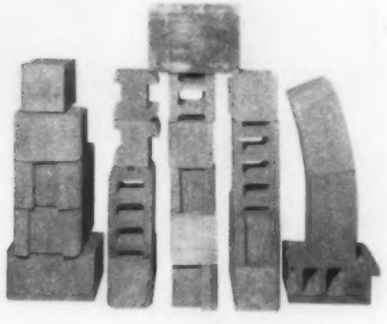
The architect when designing the building did not take into consideration whether or not the blocks as specified were readily available. Nevertheless, contracts were let and construction started, and then came the problem of manufacturing the special blocks. These were to be radial units for round bays, as well as the starter blocks for the bays, double bull-nose full and half block 12 inches wide, double bull-nose units for door and window jambs, as well as the new type glass blocks that are now so popular. These had to be made in both 12-inch and 8-inch widths; altogether there were 16 various sizes and shapes necessary. The cost of equipping the company's strippers to turn out these special units would have been prohibitive and would have required considerable time. So the problem was solved by using a Jackson & Church Vibrite plain pallet stripper machine. The installation was quickly made and all the special units were produced and ready for use in a very short time. The same mix was used in the Vibrite machine as was used in the tamp machine which turned out the regular units and when laid up in the building, all were uniform in appearance, texture and strength. By utilizing the smaller machine for the "specials," the big production machine was kept busy making regular block. Otherwise, considerable time and expense would have been necessary in stopping the large machines to change over at frequent intervals to allow the production of "specials" and fractional units.

A detail of the building.

All concrete block made at the Boice Brothers plant are cured with high-pressure steam and are light in color. Architects prefer the high-pressure-steam-cured blocks since they know that there will be no more shrinkage once they are laid in the wall and users are usually willing to pay a one-cent premium for this type of unit.

The company also makes concrete bricks and ready-mixed concrete, three truck-mixers being in service. Charles A. Nicely is president and R. E. Cromis secretary-treasurer and general manager.

The small vibrator machine used to make the special-shaped units.



Some of the "specials" used in the building.

After 54 Years Block Manufacturer Still Solves Own Problems

By R. K. ANDRIST

The block plant and part of the yard with rack being unloaded and truck loaded in foreground.

The motor and V-belts driving the bucket-elevator.

A PLANT where everything except the electric light bulbs shows the influence of the ingenuity of the owner—that comes very near to being a description of the block plant of the Crown Sidewalk & Block Company of Minneapolis, Minnesota. With more than half a century of existence behind it, the organization shows the ingenuity that can be exercised in meeting special conditions. The business interests of the firm are guided by the three sons of the original founder, Earl W., Paul, and Robert Anderson, but when one looks at the mechanical organization of the company, almost everything he sees reflects the ingenuity of George Erickson, plant superintendent. There is little about the plant that does not bear some mark of his mechanical ability.

Although sidewalk and general cement contracting are still the most important activities of the firm, accounting for about two-thirds of the total business, the most interesting in many respects is the cement-block plant. Formerly cinder blocks also were made, but their manufacture has been discontinued, and the crushing machinery is used now only in the side-line business of supplying crushed cinders for running tracks and similar requirements.

Most of the raw material is brought in by railway on a siding which terminates beside the storage tower over a hopper covered by a heavy steel grating. The coarse sand and "pea" rock are dumped into the hopper from gravel cars; the fine sand, used in comparatively small quantities, is brought in by trucks which also dump into the hopper. Carloads of cement are also "spotted" over the grating, but the sacks are unloaded over a runway into a storeroom where they are readily available to the mixer operator.

Elevating the sand and "pea" rock from the hopper to the storage bins in the tower is done by a bucket-elevator powered by a 7½-horsepower Century electric motor. Power is transmitted from the motor to the chain by V-belts. This type of belt is used extensively throughout the plant wherever power must be transmitted at relatively high speeds, and the firm has found V-belts, as the plant superintendent puts it, "life savers" in eliminating the breakage, slipping and throwing of belts. The sand and "pea" rock are easily diverted in the tower into the proper storage bins by a small pivoted sheet-iron table or plate, which may be tilted to either side.

At the bottom the storage bins empty through chutes into a small hopper car on rails. This car, made by Mr. Erickson, is divided into two compartments; the larger is always filled with the same amount of coarse sand, while the smaller is filled with both fine sand and "pea" rock. The relative proportions of these two latter materials depend on the comparative fineness or coarseness of all three aggregates, and is decided by the experience of the operator.

The operator pushes the filled car about 10 feet to a position over a hole in the floor directly above the mixer. About 15 pounds of Dewey Masonite is added to the aggregates to give plasticity to the cement, and the car is emptied through its bottom into the mixer. The operator dumps two sacks of cement into the mixer and, finally, the water. The water, supplied by a barrel, sprays into the churning aggregates and cement from a pipe with holes in its under side. Although a gage on the barrel shows the approximate amount of water to be added, the final decision is left to the operator. After the mix-

The motor-operated lift truck being operated by its builder, George Erickson.

ture is thoroughly homogeneous he scoops out a small sample, tests it, and, if it is still too dry, adds additional water. The advantage of leaving the final proportioning, of both the water and the aggregates, to the operator instead of depending on a rigid formula is obvious, since the sand varies in both coarseness and in moisture content.

The mixer is a 21 cubic foot Ideal, powered through V-belts by a heavy-duty 10-horsepower General Electric motor. This mixer has been extensively altered and rebuilt, increasing its efficiency in relation to the rest of the plant. Even so, the mixer is the bottleneck of the plant at the present time. Although the operator so organizes his work that the mixer operates constantly, the car standing over the mixer ready to dump a new batch as soon as the one in the mixer is emptied, the block machine can not be supplied with enough concrete to keep it going at full capacity. This fault will be remedied in the near future when a new mixer, designed and constructed by Mr. Erickson, will be installed. It will embody a new and original design.

The mixer empties into a skip bucket which is pulled up a steep inclined track and emptied by means of a hoist and cable powered by a 5-horsepower Century electric motor. Again V-belts are used to transmit the power. The

The batching car which carries aggregates from the bins to the mixer.

skip bucket empties into a steel hopper mounted on the top of the block machine, and the cement runs down by gravity.

The block machine is perhaps the most interesting feature of the entire plant. It is, in its entirety, the work of Mr. Erickson. It has taken over the former work of an Anchor automatic stripper, which is now used in making corner blocks and "specials." Features still to be added to the block machine will make it also capable of making this type of blocks. The outstanding features of the new machine are its slow motion, and the small number of moving parts. There are two sets of tampers, one set on each end, so designed that while a block is being made on one end, a finished block is being removed from the other and a new pallet put in. Thus it really is, in effect, two block machines in one. One operator takes care of both sides, stepping back and forth one or two steps, taking care of the pallets. The two sides can not be operated independently of each other, but different size blocks can be made on the two ends. There is no kick-off, the blocks being removed from the machine to the racks by hand. Besides the operator, two other men work at the machine, one at each end removing blocks to the racks.

The machine is designed to turn out 9 blocks per minute, but at the present time this rate can not be kept up through an entire day's run because of the limited capacity of the mixer. One 21-cubic foot batch of cement will make between 35 and 36 8- by 12- by 16-inch blocks.

Power for the machine is furnished by a 3-horsepower General Electric motor. This is possible because in stepping down the speed a large mechanical

A block ready to be lifted off one side of the machine.

Block being removed from the other side of the machine.

Part of storage yard and loaded truck viewed from the top of the plant.

advantage is gained, while the small number of moving parts reduces friction losses. Also, with so few parts, the chances for trouble are greatly reduced. There is almost no vibration in the machine; even before it was anchored to the floor there was no "walking" due to this cause.

The loaded racks are taken into the kilns—the nearest of which is perhaps only 20 feet from the block machine—by a motor-operated lift-truck. This truck is also a "child" of Mr. Erickson. The power comes from a LeRoi engine. The rear or driving wheels are of the automobile type, while the two front wheels are of very small diameter and are solid-rubber tired. The truck is

The aggregate-storage tower and a car being unloaded.

driven under a rack; then the platform is raised a few inches, lifting the rack from the ground. The driver rides on the truck, and manages all the operations from his driving position. Extreme maneuverability and fast running speed result in a great saving of time and effort. This was well illustrated to the writer when a minor breakdown (the loss of a nut on the steering gear) necessitated putting on a hand-operated lift truck for perhaps half an hour. Even with two men working it they fell far behind in that short time.

There are six curing kilns, each with a capacity of 20 racks, a rack holding 56 8-inch blocks or 40 12-inch blocks. Wet steam at about 125 degrees F. is supplied by a Scotch marine boiler. This boiler also bears the results of Mr. Erickson's improvements. He has completely altered the arrangement of the firebox so that there is a much better utilization of heat, resulting in a great saving of coal and greater efficiency. The blocks are steam-cured for approximately 30 hours, and then brought out and piled in the yard.

The same truck is used to take the racks of cured blocks to the stock-pile and to bring the empty racks back into the shed. The loaded rack is left at the stock-pile, where a worker unloads the blocks on the pile. Each block is stamped in ink with the date and with the factory number assigned by the City of Minneapolis for inspection purposes. This completes the work of stock-piling. From mixer to stock-pile 6 men operate the plant.

At the present time most of the racks are of wood, but they are being gradually replaced with steel racks, made in the company's shops. They are welded throughout and will eliminate the inconvenience caused by breakage in the wooden racks.

The company operates 7 trucks, all Ford V-8's, 1½-ton, although an overload is carried. Some of these trucks are used for the general-cement-contracting side of the business. There are two block trucks, two repair trucks (used in sidewalk and cement work), and three dump trucks.

A period of intensive building in the Twin Cities is giving the plant an immediate market for its output. Almost all the blocks—perhaps 99 per cent.—are sold within the Twin Cities area, although an occasional carload does go outside the city.

The advertising is mainly good-will, through church, lodge, club, and similar contacts, although paid advertising is also used.

The offices of the firm have been moved from their former location above the plant to a more modern (and quieter) location across the street in a modern one-story red-brick building.

Study Experiments with Asphaltic-Type Road Beds

The New York Central Railroad, in coöperation with the Association of American Railroads, is conducting tests to determine the practicability of using asphalt road-beds for railroads. This test is being conducted on a stretch of track 600 feet long on the New York Central Lines near Bryan, Ohio, where regular crushed-rock ballast has been mixed with asphalt and placed under the track and between the ties. Below the ties the mixture is 8 inches thick. In the center of the track it reaches to within 1 inch of the top of the tie but gradually slopes to either side of the track in order to provide proper drainage. The surface has the appearance of regular asphalt paving. The railroads in general are showing considerable interest in the experiments.

Truck-Mixer Rental Service

Producers of ready-mixed concrete who may be in the need of additional truck-mixers for either a short or long period of time may now obtain them without capital investment on the rental plan recently announced by Conserco, Incorporated, of Washington, D. C.

According to John Olcott, vice-president and general manager of Conserco, the plan enables the operator to increase his production without increasing his capital investment. Many operators are using rented trucks, truck-mixers or both since it enables them to operate at a fixed, definite cost . . . a fact revealed at the recent convention of the National Ready Mixed Concrete Association at St. Louis. The accompanying illustration shows a typical fleet of Conserco truck-mixers.

Fleet of six rental truck-mixers.

ADDS EQUIPMENT TO PRODUCE BRICKS

Storage yard of Kaufman Duntile plant with plant in the background.

IF YOU are making blocks, why don't you make bricks?

If you're making bricks, why don't you make blocks?

These questions, which have perplexed every concrete manufacturer since the industry has been dignified by that term, was solved recently by George E. Dunn of Saginaw, Michigan, in the only way in which it can be solved. He was making blocks, so he bought a brick machine.

If fellow members of the craft could visit his plant—the Kaufman Duntile Company—they would quickly perceive that the solution was just as simple as it sounds, for the bending of a car track slightly to the right was about all that was necessary to effect production of bricks as well as blocks.

The Dunn plant is not a big one, nor is it exactly small, but after 16 years in the business this producer has learned a few things and it will be the purpose of this narrative to tell some of them.

George Dunn was a contractor, when he started this enterprise back in 1924, and his brother-in-law, Harvey E. Kaufman, was an architect. They saw an added opportunity and became partners in the new venture, Mr. Kaufman as president, and Mr. Dunn as secretary-treasurer and general manager. Two years later they gave up contracting and concentrated on the products business. Mr. Kaufman in the meantime devoted most of his time to his profession and left the plant to Mr. Dunn. This arrangement holds good today.

That the business was successful is attested by the fact that it weathered the depression. In 1929 before the upheaval the plant produced 260,000 units. Now, with demand nearly normal once more, Mr. Dunn expects to do as much again, and certainly with much less effort and less expense.

He is operating a Stearns junior stripper, for example, that will turn out 2,000 blocks a day with a full crew of three men, one at the 14-foot mixer overhead and two for the machine and the cars on which he racks the product.

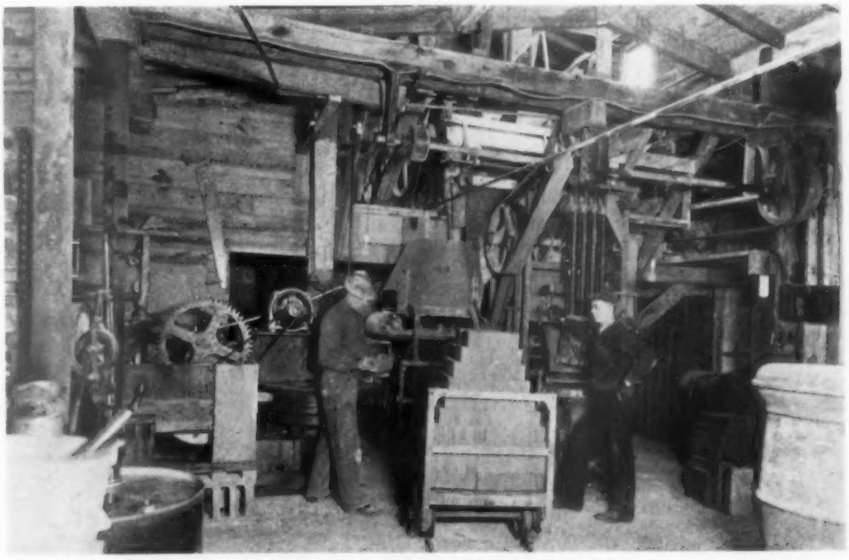
Here we come to the brick phase of the business—also to the matter of the bent rails.

The entire production lay-out in this plant, including gravel storage, skip elevator, mixer and platform, take up only the area of a two-car garage. Adjacent to the block machine, in a space 6 by 10 feet in size, stands the new brick machine—a model C of Jackson & Church make. Had the hopper been placed above instead of at the side, the space could have been cut down to 6 by 6 feet.

Now the same plant can produce, with equal facility and without disturbing the routine in any way, 14,000 concrete bricks a day with the same three men working as in the case of block production, except that there are no pallets to bother with as the bricks are stacked on the cars as they come from the press.

The brick machine is driven by a 7½-horsepower motor which takes care of the feeding hopper as well. The block-machine mixer and elevator also have individual motor drives.

There are 30 cars for blocks and bricks, each holding 60 8-inch blocks or



Interior of plant showing close coördination of manufacturing facilities.

800 standard-size bricks. These cars are shunted into six tunnels built of concrete blocks, where steam from a low pressure boiler gives them their initial curing. At this time of the year they remain in the curing tunnels for 48 hours; in the summer for 24. Then they go to the yard, where they stay for at least 28 days before being delivered.

Two International trucks are maintained, one bringing in gravel from various sources of supply 25 miles away, while the other is used for hauling blocks, bricks and tiles to the job, also building materials such as cement and gravel, which are retailed.

The storage bin for gravel holds 150 tons. A steam line from the boiler is used to thaw the aggregate at low temperatures. An adjoining bin holds a carload of cement.

One of the peculiarities of this business is the large demand for 5- by 8- by 12-inch tiles. More than 50 per cent. of the production at present is on this unit. A recent order, for example, called for 156,000; another for 56,000; another for 16,500.

Concrete bricks, too, are in great demand in this area and Mr. Dunn believes he is going to get his share of the business now that he has a compact, efficient plant that will take care of any normal demand. And, if the demand becomes too great, he says, there is nothing to stop him from buying some more machinery of the same kind but with greater capacity.

Fire Damages Plant

Fire in the office building of the Valley Ready Mixed Concrete Company, Appleton, Wisconsin, on January 24 did damage estimated at $1,200. The blaze is believed to have started under the roof from an overheated chimney.

A Correction

Captions descriptive of the Kirkham vibrator and the Dunn drain-tile machine were inadvertently transposed on page 142 of the January issue of PIT AND QUARRY. The Kirkham machine is manufactured by the Concrete Transport Mixer Company of St. Louis, while the W. E. Dunn Manufacturing Company of Holland, Michigan, makes the concrete drain-tilt machine.

HOW TO BUY THE TRUCK MIXERS YOU NEED NOW!

AND PAY FOR THEM AS YOU USE THEM!

● Want to add to your fleet of truck mixers? Want to replace old-fashioned units with new, mechanically superior Rex Moto-Mixers? Want to go after the ready-mixed concrete business in your territory without too great an initial investment?

If you do, investigate Rex Moto-Mixers, now available on the time payment plan that allows 12 full months for you to pay!

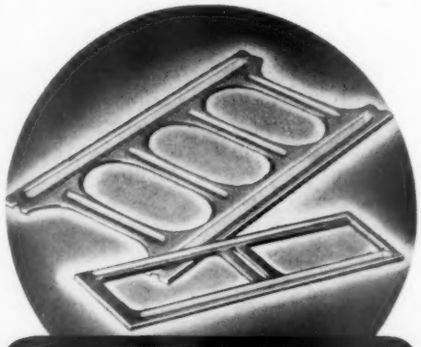
You'll find that Moto-Mixers, with their unique advantages including Rex high discharge (jackass hoist) and Rex one-point water distribution, are easy to buy, economical to own and profitable to operate! Hundreds in the field during the past 12 years, serving dozens of satisfied customers, indicate how well you'll be pleased with Moto-Mixer performance.

Don't delay! Go today to your nearest Rex dealer or write to our home office for complete details on financing the sale of the number and size of Rex Moto-Mixers in which you are interested. Also ask for informative literature. Address the Chain Belt Company, Dept. MM-3, 1646 W. Bruce Street, Milwaukee, Wis.

ASK ABOUT THE TIME PAYMENT PLAN!

BUY

REX MOTO-MIXERS AND BE RIGHT!



LESS DEAD WEIGHT

COMMERCIAL CORED STEEL PALLETS ARE LIGHTER IN WEIGHT

In one day's production of two thousand 8" blocks, the plain pallet user handles approximately 108,000 pounds more pallet weight than the cored pressed steel pallet user and 88,000 pounds more pallet weight than the cored cast iron pallet user. Or equivalent in human effort to handling two carloads of material—*every day!*

THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO

FOR SALE

Stearns Power Stripper, with vibrating attachment all sizes pallets.
Twelve cu. ft. mixer.
100 h.p. stock pile bucket drag.
Complete gravel washing plant will produce 80 yds. per hr.
2 yard ready mix trucks.

PYRAMID BLOCK COMPANY
National at 67th St. West Allis, Wis.

Problems Facing Concrete-Pipe Industry Discussed as ACPA Holds 33rd Annual Convention

NEARLY one hundred of the nation's leading concrete-pipe manufacturers, engineers and other interested individuals attended the sessions of the annual convention of the American Concrete Pipe Association at the Palmer House in Chicago on February 15, 16 and 17. From the standpoint of attendance, interest and enthusiasm the gathering was one of the finest held in the 33 years the association has been in existence, the organization having been formed at Ames, Iowa, in 1907.

In his annual report at the opening of the meeting, M. W. Loving, secretary-treasurer, pointed out that the industry has just completed a fairly prosperous year, volume of output in 1939 having exceeded 1938 by nearly 15 per cent. He discussed the proposed engineering handbook on concrete pipe from the standpoint of contents, cost, distribution, etc. The matter of advertising concrete pipe on a national scale was also taken up, some of the members being of the opinion that such a campaign is necessary to offset similar publicity campaigns being carried on by the makers of competitive products.

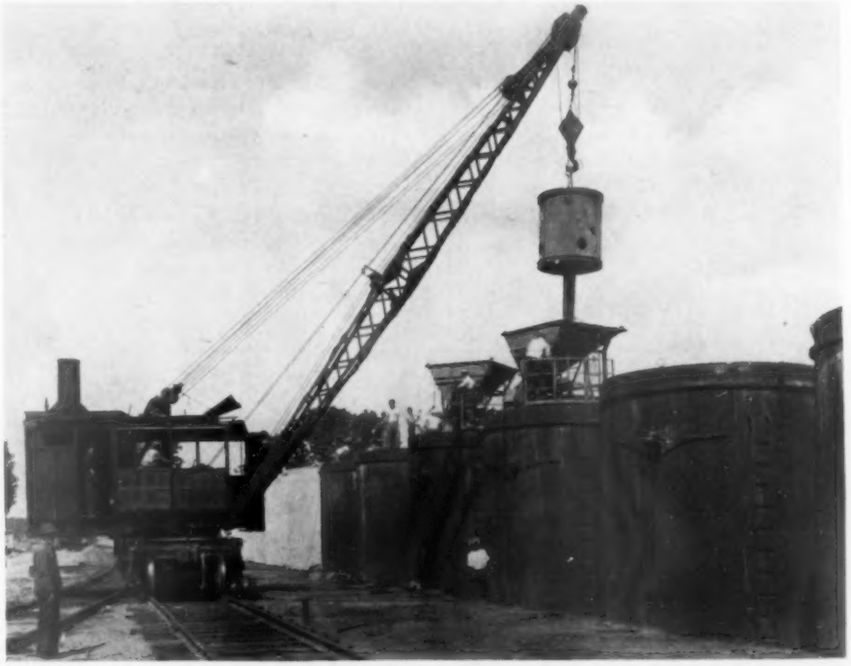
Mr. Loving told of some of the outstanding concrete-pipe jobs which have recently been undertaken and illustrated his talk with slides. Large-diameter pipes being laid at Gary, Indiana, in connection with a large-scale sewerage and sewage-disposal plant project were joined with special rubber gaskets which have prevented infiltration entirely, Mr. Loving said. He urged all manufacturers to concentrate on the production of a high-quality, dense, impermeable product pointing out again that when percolation begins concrete pipe is doomed. He warned against the use of obsolete or dilapidated equipment, pointed out that the proper placement of reinforcing steel was an important manufacturing requirement and emphasized particularly the necessity for making a top-quality product in the smaller sizes if volume is to be gained and retained in this highly-competitive field.

Future planning of public improvements in a large metropolitan area is a tremendous task, as Robert Kingery, manager of the Chicago Regional Planning Association, explained in his talk which opened the afternoon session. He described the detailed surveys made by the planning body in determining population trends, traffic requirements, etc., for the guidance of municipalities and private builders in making improvements to fit future needs. The Chicago region served by the association which Mr. Kingery heads embraces 15 counties, 9 in Illinois, 3 in Wisconsin and 3 in Indiana. Besides the city of Chicago, it includes over 200 other communities.

The highlight of the convention from a technical point of view was the paper presented by Professor R. B. Crepps of Purdue University, La Fayette, Indiana, on pre-stressed reinforced-concrete pipe. "Pre-stressed pipe has gone through the experimental stage and is now entering the practical and installation stage," Professor Crepps declared. He traced the early attempts at pre-stressing started more than a quarter century ago and the studies of the phenomenon which have been carried on at Purdue University for the last nine years. Pre-stressing experiments began at Purdue in 1931 at the instigation of the Lewistown Pipe Company of Fort Wayne, Indiana. In 1936, the speaker related, one of the first successful uses of pre-stressed pipes was made at a hydro-electric power plant in France and the project attracted engineering attention throughout the world. An interesting installation undertaken last year was described and illustrated by Professor Crepps in considerable detail, the job involving 24-inch and 36-inch wire-wound pre-stressed pipe on a P.W.A. project at Hammond, Indiana. Pre-stressing has definitely proved itself to be more reliable than conventional designs because the tensile stresses in concrete are completely cancelled and the compressive stresses that occur over the entire cross-section of the pipe tend to prevent the occurrence of cracks. The speaker summed up his talk with these four important conclusions:

1. In the field of concrete pipe the principles of pre-stressing should be held on a plane equal at least to that for the design of building structures.
2. In pre-stressing an elastic structure of steel and concrete is obtained with the concrete contributing to a much greater extent than possible in the normal bonded reinforced-concrete pipe.
3. In pre-stressing a new tool is available for the design of concrete pressure pipes, with allowable pressures ranging above those encountered in most field conditions.
4. In pre-stressing economical advantage is taken of the modern advance achieved by the manufacturers of high-strength steels and high-quality concretes.

The manufacture and installation of reinforced-concrete pipe up to 150 inches in diameter for the Metropolitan District Water Commission of Boston was



Pouring pipe forms on the Boston Water Commission aqueduct project. A moving picture showing the manufacture and installation of these pipe sections was a program feature at the American Concrete Pipe Association's annual convention.

AMERICAN CONCRETE PIPE ASSOCIATION
1940

OFFICERS

H. D. Palmore, President,
(Kentucky Concrete Pipe Co., Frankfort, Ky.)

J. W. Porter, Vice-President,
(Gifford-Hill Pipe Co., Dallas, Tex.)

L. D. Bailey, Vice-President,
(Cretex Companies, Inc., Elk River, Minn.)

J. E. Miller, Vice-President,
(Lewistown Pipe Co., Fort Wayne, Ind.)

M. W. Loving, Secretary-Treasurer,
33 West Grand Ave., Chicago, Ill.

DIRECTORS

UNTIL 1943: C. W. Diecks, (Lock Joint Pipe Co., Ampere, N. J.)
M. C. Kelly, (Great Lakes Concrete Pipe Co., Buffalo, N. Y.)
S. H. Clark, (Carolina Concrete Pipe Co., Charlotte, N. C.)

UNTIL 1942: C. B. Warren, (Spokane Concrete Pipe Co., Spokane, Wash.)
B. J. Ukropina, (United Concrete Pipe Corp., Los Angeles, Cal.)
J. D. Mollendorf, (Illinois-Wisconsin Pipe & Tile Co., Chicago, Ill.)

UNTIL 1941: J. A. Dunn, (Hume Pipe Co., Swampscott, Mass.)
R. S. Lander, (Shearman Concrete Pipe Co., Little Rock, Ark.)
G. B. Denham, (Faulkner Concrete Pipe Co., Hattiesburg, Miss.)

graphically portrayed by a motion-picture supplied through the courtesy of the pipe maker, the Lock Joint Pipe Company of Ampere, New Jersey. Two plants were specially built to serve this aqueduct project. Inner cylinders and reinforcing cages were also manufactured at on-the-job plants. Locomotive cranes handled the huge concrete buckets used to fill the forms which were vibrated as pouring progressed. After curing the pipe sections were hauled to the job by special tractors and low-bed trailers, removable inner struts protecting the huge sections while in transit. (See Pit and Quarry, September, 1939, page 68.)

Closed sessions were held on the second day of the convention, admission being restricted to members, while election of officers and unfinished business closed the session on the third and final day. Round-table discussions on the proposed changes in A.S.T.M. standard specifications for concrete pipe, and on problems facing the industry were conducted and committee reports were heard.

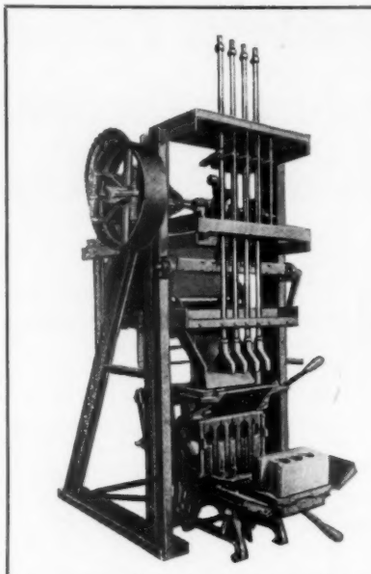
H. W. Chutter, manager of the Jourdan Concrete Pipe Company of Fresno, who served as president of the association last year was unable to attend the gathering. His annual report was read to the gathering and the healthful condition of the industry was indicated in his revelation that 20 companies had joined the association in the last two years.

The annual dinner was held on the evening of the first day and was featured by a floor show and dancing in the club annex dining room at the Palmer House.

Plattsburgh Concern Adds Pipe Plant

The Plattsburgh Stone Products Corporation of Plattsburgh, New York, has completed the erection of a concrete-pipe plant and has gone into production. Units up to 54 inches in diameter will be produced and will meet the rigid specifications of the New York Highway Department.

The Plattsburgh concern also entered the ready-mixed-concrete business several months ago.



Recognized Everywhere

The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Jolterete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

VIBRATION
—combined with
Pressing Makes the Best Blocks

Here's the Machine That Does It

KENT MACHINE CO.
Cuyahoga Falls, Ohio

STANDARD
Wherever Concrete Pipe Are Made

R&L "CRESCENT" Pipe Molds
For Either Wet or Hand Process Manufacture

Made in any length or diameter with either Tongue and Groove, Bell and Spigot or Plain Ends.

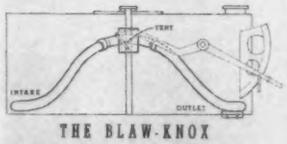
Medium, Heavy and Extra Heavy Duty Forms for Sewers and Culverts, Well Casing, Drainage, Septic Tanks, etc.

WRITE for Catalog and Prices.

R&L CONCRETE MACHINERY CO.
Kendallville, Indiana.
For more than 35 years makers of dependable concrete pipe molds and pipe machines.

"WATER CONTROL?

The BLAW-KNOX TRUKMIXER has the most accurate water measuring systems for all positions of the tank"



THE BLAW-KNOX WATER MEASURING SYSTEM

Tests show—only Blaw-Knox TKUKMIXERS have this accurate, practical, dependable water measuring system. Described in Bulletin No. 1643.

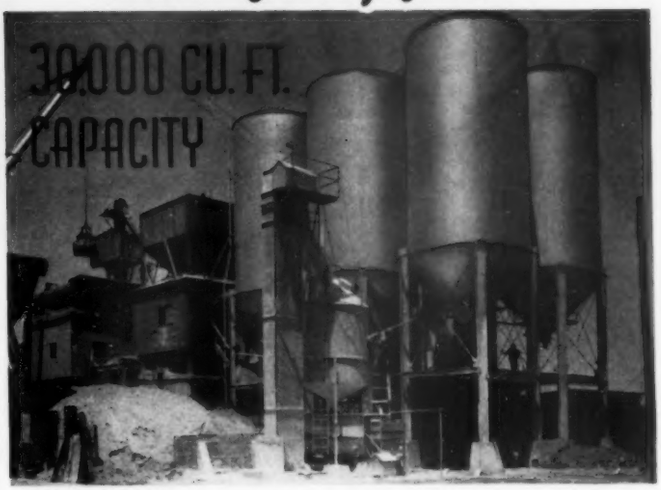
Buy Blaw-Knox Trukmixers. Get the advantage of automatic accurate water measurement, together with many other exclusive features.

20

BLAW-KNOX TRUKMIXERS and Agitators

BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. Pittsburgh, Pa.

THE BROOKS-TAYLOR
Lime Putty Plant

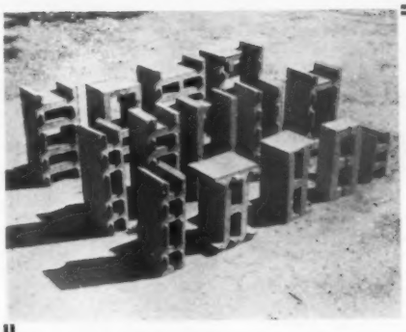


The Colonial Sand & Stone Company has installed two additional ageing tanks at its lime putty plant, increasing the total capacity to 30,000 cu. ft. The use of lime mortar and aged lime putty is expanding rapidly. Write for information on the Brooks-Taylor Process.

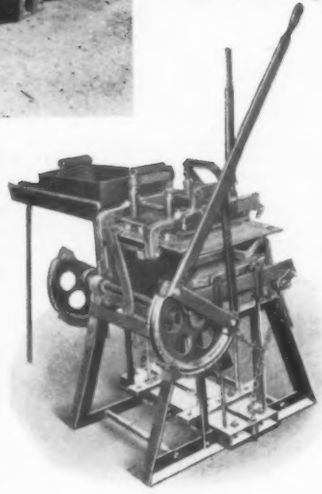
CHICAGO BRIDGE & IRON COMPANY

Chicago	2451 Old Colony Bldg.	Tulsa	1648 Hunt Bldg.
New York	3389—165 Broadway Bldg.	Birmingham	1503 North Fiftieth St.
Cleveland	2264 Rockefeller Bldg.	Dallas	1486 Liberty Bank Bldg.
Philadelphia	1645—1700 Walnut St.	Detroit	1552 Lafayette Bldg.
Boston	1550 Consolidated Gas Bldg.	San Francisco	1092 Rialto Bldg.
Houston	2919 Main Street	Los Angeles	1457 Wm. Fox Bldg.

In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.



You Can't Beat It for Economy



HERE'S NEWS! An inexpensive but powerful hand-operated DOUBLE PRESS Concrete Block Machine that makes high-strength building units at new low cost.

Machines available for any size or design of block or brick desired. Capacity up to 4 units per minute.

Why tie up your money in a high priced machine, when you can buy a Double Press Machine that will do equal quality work!

Patented

Write Today for Facts

MORTARLESS TILE MACHINE COMPANY, Inc.
3328 San Fernando Road
Los Angeles, California

END BACK AND BLOCK BREAKAGE WITH BARRETT *Lift Trucks!*

TRY BEFORE YOU BUY! Use it 15 days FREE in your own plant—see for yourself what they save in work and costs.

One man, a Barrett and a rack readily move 48 of the 8"x8"x16" or 32 of the 8"x12"x16" blocks to the curing room with little effort and without breakage, jogging out of shape or spoilage. Super spring frame and rubber tires do the trick. Lets load down easy.

Barretts have proved lowest cost equipment for handling stones, blocks, pipes, tile, bricks, sewer rings and other cement products. Send today for bulletin and prices.

Barrett Handling Equipment

BARRETT

BARRETT-CRAVENS CO.
3251 West 30th Street • Chicago, Illinois
Representatives Everywhere

SMITH-MOBILES *in New Zealand!*

Acclaimed by Contractors and Ready Mixed Concrete Operators Everywhere as the LAST WORD in Truck Mixer Design

"Deliver the Concrete in One of Those New Smith-Mobiles!"

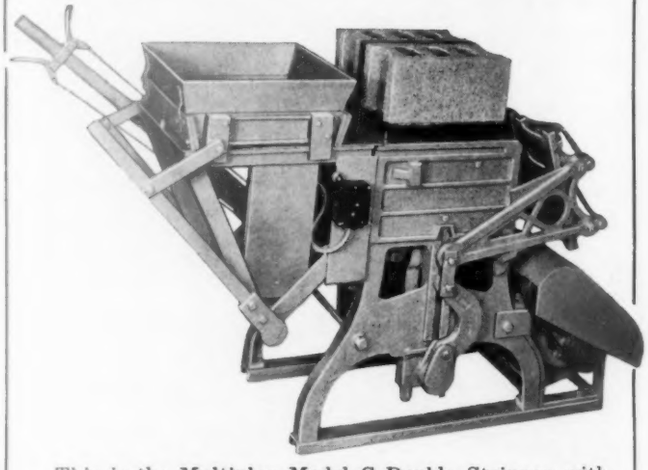
That's what many customers specify when they order from Certified Concrete, Ltd., Wellington, New Zealand, owners of nine Smith-Mobile Agitators. These customers actually insist on getting their concrete delivered in Smith-Mobiles instead of in old style agitators. They like the VISIBLE MIXING feature . . . HIGH DISCHARGE without hoist . . . CONTROLLED DISCHARGE for fast or slow pouring . . . STEEP DISTRIBUTING CHUTE for dry concrete . . . LARGER RADIUS OF SPOUT DISTRIBUTION . . . BETTER AND FASTER MIXING ACTION. And there are many other valuable Smith-Mobile features. Write for catalog No. 198.

THE T. L. SMITH COMPANY
2887 N. 32nd St. • Milwaukee, Wis., U. S. A.

PERFECT COMBINATION
Smith Tilting Mixers for pre-mixing or pre-shrinking concrete . . . and Smith-Mobile Agitators for delivering pre-mixed or pre-shrunk concrete.

THE *Modern* TRUCK MIXER and AGITATOR

This Time Tested Unit Now Available *with Vibration*



This is the Multiplex Model C Double Stripper with the new variable speed vibrator attached. Vibrates while filling, and pressure is applied to finish top of block.

Makes plain and face block in all sizes from 3" to 12" in width, with press-top finish.

Investigate this new unit.

THE MULTIPLEX CONCRETE MACHINERY COMPANY
ELMORE OHIO

START A NEW BUSINESS

This shows one of our Multiple Molds for casting 8x8x16" concrete blocks. We manufacture a complete line of Multiple Molds for blocks (both Rockface and plain), for brick, veneer blocks, etc. We are also owner and originator of the ZAGELMEYER SYSTEM of granite veneer for blocks.

Make
ZAGELMEYER
Waterproof Concrete Blocks

A Start May Be Made With as Little as $500.00

The Zagelmeyer System produces a block that no other system can equal. Many good territories open. Write today for further information.

Zagelmeyer Cast Stone Block Machinery Co.
502 S. Henry St. BAY CITY, MICH.

HOTEL PHILADELPHIAN

FORMERLY HOTEL PENNSYLVANIA
DANIEL CRAWFORD, JR., MANAGER
39th and CHESTNUT STREETS
PHILADELPHIA, PENNA

Our courteous and competent staff will give you the utmost in friendliness, comfort and service. Conveniently located to all stations, and only five minutes away from the heart of the business section.

600 ROOMS each with bath from $2.50 up

Lounge and Restaurants Unrestricted Parking to 3 A.M.

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

SYMBOLS
DL = Day Letter
NL = Night Letter
LC = Deferred Cable
NLT = Cable Night Le
Ship Radiogram

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destin

1940 FEB 26 12 25 PM

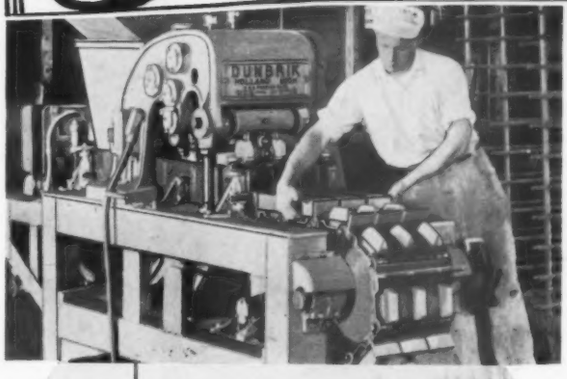
GP66 22=LYNCHBURG VIR 26 1203P

W E DUNN MFG CO=

JUST CLOSED ORDER FOR MILLION DUNBRIK WILL REQUIRE EXTRA CAPACITY STOP PLEASE GIVE US FIRST CONSIDERATION ON SURROUNDING TERRITORY FOR ADDITIONAL PLANTS=

VIRGINIA DUNBRIK CO INC.

Going to Town



VIRGINIA DUNBRIK IS GOING TO TOWN. So are many other DUNBRIK manufacturers. Why? Because they own the enterprises having all requirements for profitable business: Quality products — Proven manufacturing methods — Modest capital investment — Large business volume — Protected territory — Nationally known products.

THEY FIND THAT DUNBRIK'S quality features of lighter weight, water repellent face, absolute accuracy, great strength, keyed bond, are all superiorities that their builders recognize and demand. That DUNSTONE in multiple sizes further broadens their market and enables contractors to build permanent fire-safe construction at a cost level of frame.

YOU TOO CAN GO TO TOWN with DUNBRIK line production machine, where low cost raw materials enter at one end—finished products emerge from the other. Time-proven processes at the same time enable you to produce all your products in a full range of colors, shades and textures.

CASH IN NOW on the growing building industry. Investigate the manufacturing end of the business. That's where the big profits are made. Return coupon today before your territory is closed.

W. E. DUNN MFG. CO. 3-40
420 W. 24th St.,
Holland, Michigan.

Show me through your free book "4 Keys to Success" how "I TOO CAN GO TO TOWN" in my territory.

Tell me where I can visit a nearby manufacturing plant and see how better buildings are being built for less with Dunbrik and Dunstone.

Name _____

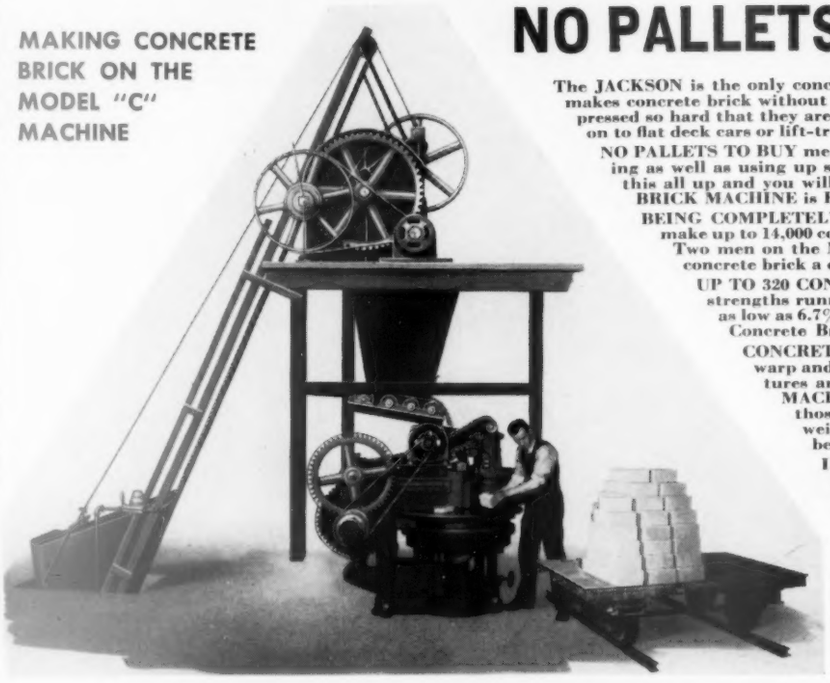
Address _____

City _____ State _____

BIG IN MONEY SAVING PERFORMANCE!

NO PALLETS–LOW UPKEEP

MAKING CONCRETE BRICK ON THE MODEL "C" MACHINE



The JACKSON is the only concrete brick machine on the market today that makes concrete brick without the use of any pallets whatever. The brick are pressed so hard that they are removed from the machine by hand and piled on to flat deck cars or lift-truck platforms and allowed to cure.

NO PALLETS TO BUY means no time wasted in handling and maintaining as well as using up space to store them when not being used. Add this all up and you will be convinced why the JACKSON CONCRETE BRICK MACHINE is BIG IN MONEY SAVING PERFORMANCE.

BEING COMPLETELY AUTOMATIC, one man at the machine can make up to 14,000 concrete brick a day, on the Model "C" machine. Two men on the Model "A" machine can turn out up to 28,000 concrete brick a day.

UP TO 320 CONCRETE BRICK PER SACK OF CEMENT with strengths running as high as 3700 lbs. p.s.i. and absorptions as low as 6.7% is being had by some producers using Jackson Concrete Brick Machinery.

CONCRETE BRICK that are uniform in size, free from warp and with clean cut, sharp edges and beautiful textures are made on the JACKSON CONCRETE BRICK MACHINERY, which makes them far superior to those made on any other equipment. Either lightweight aggregates, cinders or sand concrete may be used.

INVESTIGATE TODAY, do not delay getting into a profitable concrete brick business with one of these machines. Our engineering department will gladly assist you in your plant layout and equipment selection.

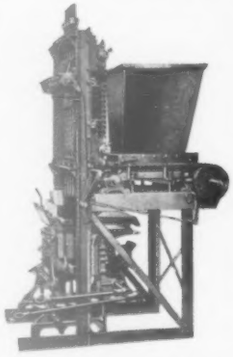
Since 1881

JACKSON & CHURCH CO.
SAGINAW, MICHIGAN

Miles CONCRETE EQUIPMENT

INVESTIGATE BEFORE YOU BUY

the PIONEER EQUIPMENT of the industry, not an experiment, but a proven success with which you are assured a larger production of high quality blocks at both a lower first cost and a lower operating cost, facts well worthy of your serious consideration.



WRITE FOR CATALOG

THE MILES MANUFACTURING CO.
Dept. 20
JACKSON, MICHIGAN

SEVEN MATERIALS IN ONE BIN?

"You Bet—this new BLAW-KNOX plant accurately measures and loads aggregates, cement, and water into truck mixers."

Blaw-Knox Truck Mixer Loading Plants include overhead storage bins for aggregates and cement; accurate Weighing Batchers for aggregates, cement and water; arranged for manual or automatic operation; complete conveyors for handling materials from cars or trucks to bins, when desired—all properly designed and built to your requirements as an efficient unit for truck mixer loading. See Blaw-Knox Catalog No. 1582. 15

BLAW-KNOX BLAW-KNOX DIVISION • OF BLAW-KNOX CO. • Farmers Bank Bldg. Pittsburgh, Pa.
TRUCK MIXER
LOADING PLANTS

JAEGERS GIVE YOU *a recognized advantage*

...Higher Strength Concrete, Produced by the Most Efficient, Low Cost Mechanism Yet Developed

—to Meet Any Specification or Demand.

1940 demand for truck mixers shows Jaeger sales almost equal to ALL OTHER MAKES COMBINED.

Jaeger, alone, offers Truck Engine Drive thru Shock-Proof Transmission, Vacuum Controlled from Cab (or separate engine drive if desired).

Only Jaeger has the Dual-Mix Drum with the Throw-Back Reversing Blades proved necessary for a fast, thoro mix.

Only Jaeger has Dual Revolving Water Sprays, spraying to both ends of drum.

Only Jaeger has the Sypho-Meter Water Tank for accurate water control.

Today, more concrete is sold with Jaeger Truck Mixers than by any other method. Send for Catalog giving data important to all operators of ready-mix plants.

THE JAEGER MACHINE COMPANY
602 Dublin Avenue — Columbus, Ohio

JAEGER

Winterhaven Hotel, Miami Beach, Fla.

Albert Anis, Architect
Fred Howland Inc., General Contractor

Stearns Joltcrete Blocks Furnished by the O'Neal Block & Septic Tank Co., Inc.

"The O'Neal Stearns Joltcrete block was used for all the exterior walls, from grade to roof. The uniform units provide true and level walls, and the textured surface is a perfect bond for the stucco finish.

"My specification writer has been advised by me to specify O'Neal blocks and if this block is manufactured with the use of your Joltcrete machine, I can compliment you on your product."

Albert Anis, Architect
Miami Beach, Florida

The superiority of vibrated masonry units is no longer questioned. It has been proven by Stearns Joltcrete and *by Stearns Joltcrete alone*. Operators of Stearns Joltcrete machines have the advantage of using the *only* system of vibration the excellence of whose products has been demonstrated by unbiased, authoritative tests.* They get the big contracts—"from grade to roof." Make this year *your* most profitable year, by making Stearns Joltcrete units. Ask for folder.

*See Wisconsin Test Results as reported in the Journal of the American Concrete Institute, Nov. 1939.

STEARNS

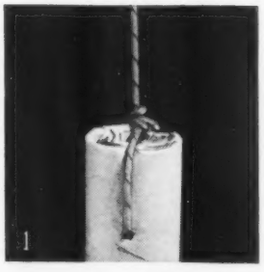
MANUFACTURING CO. - ADRIAN, MICH.

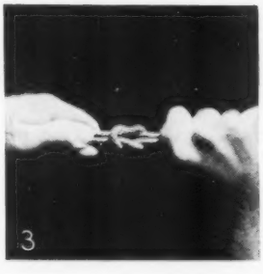
GENE OLSEN, PRESIDENT

Manufacturers of vibration and tamp block and brick machines, mixers, skip loaders, etc.

LESS hazard

Risks are *reduced* when you use Primacord-Bickford Detonating Fuse. This modern, insensitive fuse cannot be set off by friction, fire or ordinary shock but must be deliberately detonated by means of a blasting cap. Since it is the detonating agent for each cartridge in the load, no caps are needed in the hole. Loading is safer, easier and quicker; danger of burned holes is eliminated; no unexploded caps or powder remain to present risks after shooting. Primacord is *good* protection for profits.





1. Tie through cartridge.
2. Half hitch branch to main line.
3. Connect main line lengths with square knot.
4. Fuse and cap on end of main line.

PRIMACORD-BICKFORD
Detonating FUSE

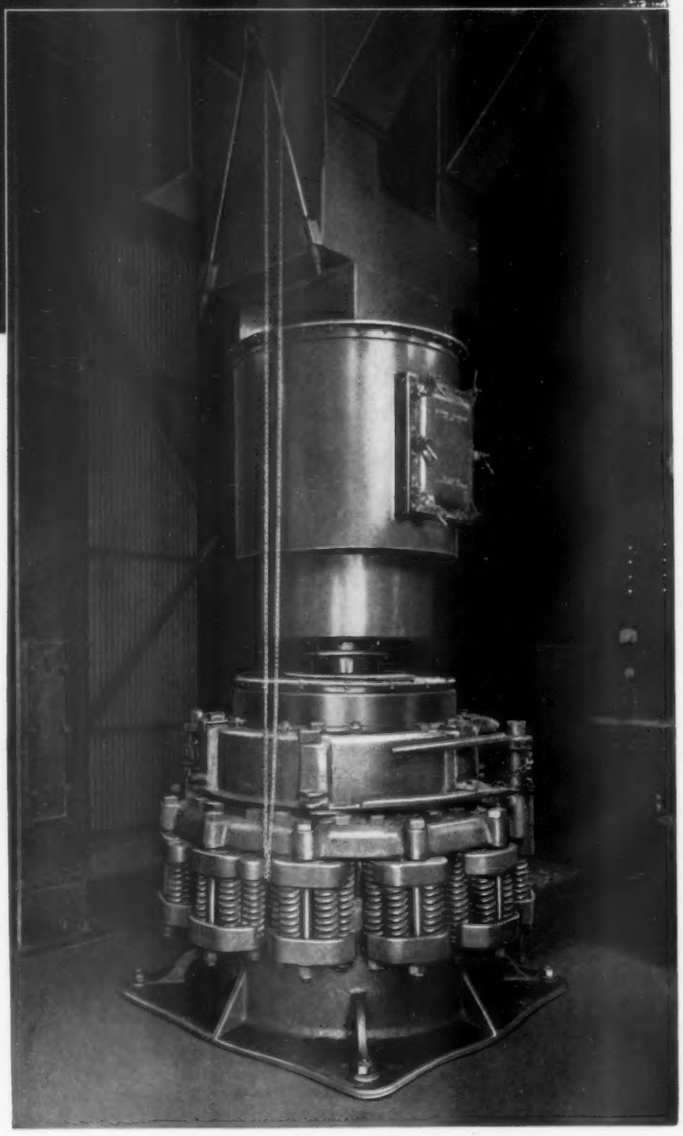
THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

PB18 *Makers of Cordeau-Bickford Detonating Fuse—and Safety Fuse since 1836*

BETTER CARE PAYS BIG DIVIDENDS

★

Profits are Greater Service Interruptions Minimized



Here is an excellent example of good installation and care of a four foot Short Head Symons Cone Crusher used for making a fine product from an abrasive material which has a tendency to produce considerable dust.

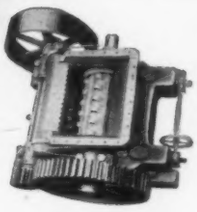
Properly installed and cared for machinery always gives better performance than that which was neglected either at the time of installation or later was only given attention after it had ceased to function properly. Well maintained equipment always brings a greater return on the investment and results in more profitable plant operation.

While designed to operate under extremely severe conditions, the Symons Cone Crusher, like any high grade machine, can not be expected to withstand abuse and neglect continually. This applies to practically all equipment used in this same general field and which, when correctly installed and maintained, pays big dividends in more satisfactory service and greater profit returns.

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

New York 60 East 42nd St. | Los Angeles Subway Term. Bldg. | Toronto Concourse Bldg. | London Bush House

SYMONS CONE CRUSHERS



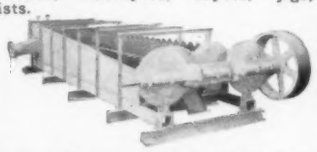
McLANAHAN EQUIPMENT

CRUSHERS

Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

SCREENS

Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

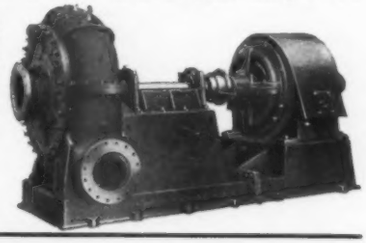


McLanahan & Stone Corp. *Established 1835* HOLLIDAYSBURG, PENNSYLVANIA

MORRIS

CENTRIFUGAL PUMPS

For hydraulic dredging, filling, sand and gravel production, hydraulic conveying of slurry and other liquids containing abrasive materials, clear water pumps for general service. Also complete dredges with all accessory equipment. Dredging pump designs include heavy-duty types and special alloy parts for severe service. Types and sizes for the largest or smallest operations, and for belt, motor, steam, oil or gasoline-engine drive.



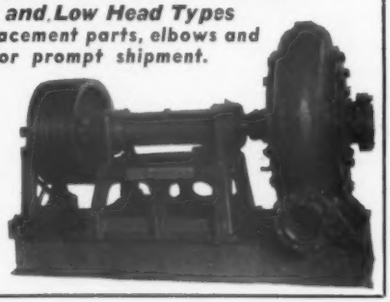
Write for Bulletins
Morris Machine Works
Baldwinsville, N. Y.

LIGHTNING

Sand and Gravel Pumps

Heavy-Duty (Ball-Bearing) and Low Head Types
Complete stock of replacement parts, elbows and fittings carried for prompt shipment.

Also clear water pumps for general service, modern design, lowest cost. High efficiency means low operating costs. Replacement parts always fit. We build abrasive material handling pumps from 10" down to 3" in size.



KANSAS CITY HAY PRESS CO.
KANSAS CITY, MO.

MARMON-HERRINGTON *All-Wheel-Drive*

ALL FORD TRUCKS, COMMERCIAL AND PASSENGER CARS CONVERTED TO *All-Wheel-Drive* IN OUR PLANT . . .

Amazing ability to perform in mud, sand, snow and on steep hills and grades. Cost less than half what you would expect to pay for a four-wheel-drive vehicle. Larger Ford trucks converted to six-wheel *All-Wheel-Drive* if desired. Write for literature.

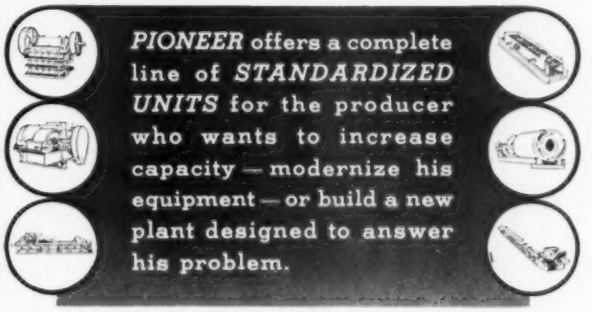
MARMON-HERRINGTON CO., INC.
Cable Address MARTON, *Indianapolis, Indiana, U. S. A.*

SIMPLICITY
GYRATING SCREENS

The Leader in Improved Screening
Available in Many Standard Sizes
For Any Aggregate Grading Job

"It's Guaranteed, without Reservation"

SIMPLICITY ENGINEERING COMPANY
DURAND, MICHIGAN



PIONEER offers a complete line of *STANDARDIZED UNITS* for the producer who wants to increase capacity — modernize his equipment — or build a new plant designed to answer his problem.

PIONEER

PIONEER ENGINEERING WORKS · MINNEAPOLIS, MINN.

RECLAIM....BY WELDING

Jaw Plates, Gyratory and Roll Crushers, Shovel Teeth, Etc.
with

MANGANAL

Manganese Nickel Steel

WELDING ELECTRODES, WEDGE and APPLICATOR BARS
HOT ROLLED PLATES

STULZ-SICKLES CO. *Sole Producers* 134-142 Lafayette St. Newark, N. J.

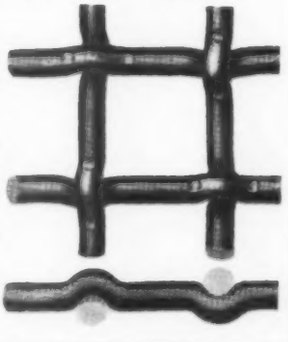
"NAT-ALOY" LOCK CRIMP MESHES ASSURE ACCURACY FOR THE LIFE OF SCREEN

"LONG WEARING"

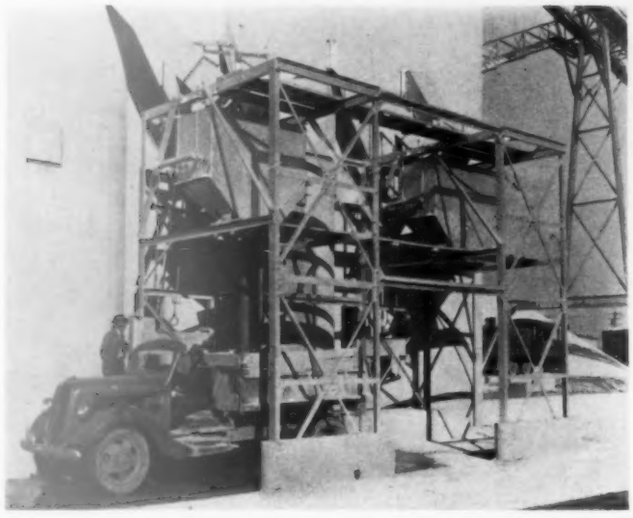
TOUGH SCREENS THAT RESIST ABRASION, WILL NOT CRYSTALIZE.

FURNISHED ALSO IN FLAT TOP AND DOUBLE CRIMP MESHES.

STOCK SHIPMENTS
WRITE FOR NEW CATALOG NO. 51



National Wire Cloth Co., Inc.
St. Paul, Minn.



Another BUTLER installation . . . . two all-steel weighing batchers with 2-beam scales on storage silos at new Memphis sand-and-gravel plant of Missouri Portland Cement Co. Permits dry-batching of aggregates direct to trucks or truck-mixers. Fool-proof . . . . efficient . . . . economical to install and maintain.

BUTLER BIN CO.

WAUKESHA, WISCONSIN

Here is a 600-ft. span Sauerman Cableway starting deep pit. The excavation shown is two seasons' work totaling 300,000 cu. yd.

DIG, HAUL & DUMP

. . . at lowest cost

Whether your problem is to dig gravel or to convey rock from quarry to crusher, or to stockpile and reclaim your surplus products—there is a size and type of Sauerman Cableway or Sauerman Scraper to meet your needs most economically. Put your problem up to us and we will save you money.

Small Sauerman Scraper supplies 25 tons of material per hour to crushing plant at hourly cost of less than $1.

SAUERMAN BROS., INC.

434 S. Clinton St., Chicago WRITE FOR CATALOG

SAUERMAN LONG RANGE MACHINES

HAUL AT LOWEST COSTS

with DAVENPORT INDUSTRIAL LOCOMOTIVES

Because Davenport Industrial Locomotives embody the best of modern locomotive practices, they insure easier and faster haulage with complete dependability. That means lower costs and increased profits throughout an exceptionally long service life.

There is a size and type of Davenport exactly suited to your needs—2½ to 100 tons. Meet your haulage problems the Davenport way. Our engineers will gladly analyze your requirements and submit dependable recommendations without the slightest obligation. DAVENPORT LOCOMOTIVE WORKS, Davenport, Iowa.

Write TODAY for Descriptive Catalog

PLANT AND MAIN OFFICE—DAVENPORT, IOWA
New York and Export Office—30 Church St.
Cable Address "Brosites"

DAVENPORT LOCOMOTIVE WORKS

GASOLINE • DIESEL • STEAM
DIESEL ELECTRIC • GAS ELECTRIC

ROUND
SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
*Reg. U.S. Pat. Off.

HENDRICK MANUFACTURING CO.
39 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities. Please Consult Telephone Directory

Lewistown Foundry Products
ARE
Performance-Tested

BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

Lewistown Foundry & Machine Co.
Lewistown, Pa.

Have you seen our Type H all-steel Jaw Crusher, or our Multi-Stage Fine Reduction Crusher? See our Bulletins 1105 and 113.

WHEN YOU MUST BE SURE,—install a

TRAYLOR

TY REDUCTION CRUSHER

When you have to be sure of getting production, and at the lowest cost per ton for power, the least wear of crushing metal per ton and no "headaches" (and, of course, you want all of these ALL of the time), put a Traylor Type TY Reduction Crusher on the job.

Don't take this on faith!—ask operators using them,—we'll give you their names. There are over three hundred of them, and they'll tell you that there's nothing fancy or intricate about a TY—just a plain machine, strong, easy to operate and having lots of crushing sense—goes about the job it understands without coddling.

Full details are given in our Bulletin 2112. Send for a copy or have our man around, or both. Write today saying where or when.

TRAYLOR ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNSYLVANIA, U.S.A.

NEW YORK CITY 3916 Empire State Bldg. **CHICAGO** 815 One La Salle St. Bldg. **SALT LAKE CITY** 101 West Second South St. **LOS ANGELES** 919 Chester Williams Bldg. **SEATTLE** 6311 22nd Ave., N. E.

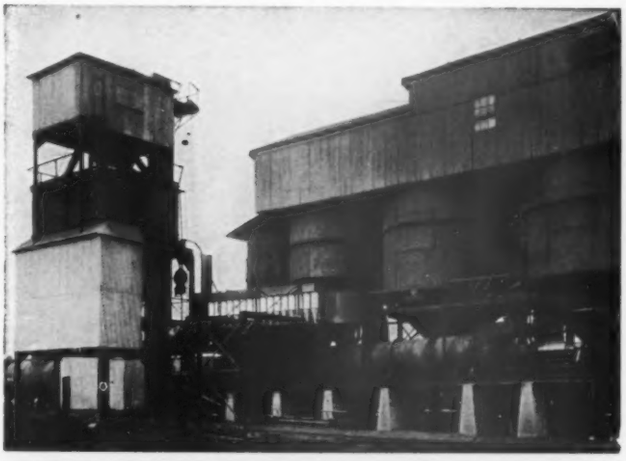
MAQUINARIA INTERNACIONAL, S. R. L., Av. Francisco I, Madero No. 17, Desp. 214, Mexico, D. F., Mexico

B. C. EQUIPMENT CO., LTD., Vancouver, B. C., Canada

MANILA MACH. & SUPPLY CO., INC., Manila and Baguio, P. I.

Export Department—104 Pearl St., New York City.

Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro.



WARREN ASPHALT PLANTS

HOT MIX —— COLD MIX

— OR —

COMBINATION UNIT FOR BOTH TYPES

CAPACITY DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

Designed and Built

—— By ——

WARREN BROTHERS ROADS CO.

P. O. BOX 1869

Boston Massachusetts

HERE'S WHY IT PAYS TO TRADE THAT *OLD* SHOVEL!

Even with the best old-fashioned excavator, your costs can't compare with the economies made possible through the use of a modern, speedy and efficient P&H machine — fastest of its type on the market. Here's all-around economy that's just as important whether you use your shovel 50 or 350 days a year! With alloy rolled steel, welded construction, tractor-type crawlers and split-second control, P&H machines meet today's needs.

P&H EXCAVATORS

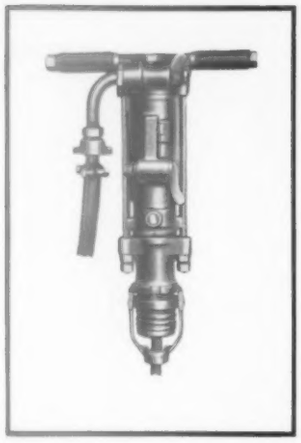
Sizes up to 5 cubic yards. Ask for bulletin on size which interests you.

General Offices: 4451 West National Ave., Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

SINKER DRILLS
that save dollars...



For quarry drilling, shaft sinking and general excavating, there is no better sinker than CP 42, with its high speed, strong rotation and exceptional hole-cleaning.

For heavy sinking, particularly in hard ground, for long hole quarry drilling and for broken formations CP 52 is a fast-drilling, low-maintenance sinker.

CP Sinkers are cost cutters. Their sustained high speed and low air consumption give you more footage per drilling dollar. Their design, full cushioning and automatic lubrication reduce maintenance costs to the minimum. » » » Write for a demonstration of CP Sinker Drills — you will find you can save many a dollar with them.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 6 EAST 44th STREET, NEW YORK, N. Y.

Sales Offices and Service Stations Throughout the World

CP **ROCK DRILLS**

Repair your conveyor belts this QUICK, EASY, LOW-COST WAY!

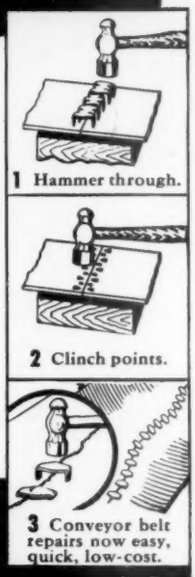
Simple and easy to apply, Bristol's Steel Belt Fasteners will give you a repair or joint that will last as long as the belt. Will not tear, work loose, or pull out.

In sizes and styles for use on any belts of every material and thickness, up to the heaviest conveyor belts. Write for Bulletin 72-5W.

THE BRISTOL COMPANY

Mill Supply Div. *WATERBURY, CONN.*

Branches in principal cities



1 Hammer through.

2 Clinch points.

3 Conveyor belt repairs now easy, quick, low-cost.

BRISTOL'S

TRADE MARK REG. U. S. PAT. OFF.

STEEL BELT FASTENERS

Confucius say:

PIT AND QUARRY
CARRY MOST
ADVERTISING
BECAUSE
PIT AND QUARRY
REACH MOST
PROSPECTS

"All the BREAKS" . . . With an AMERICAN CRUSHER
BUT NO BREAKDOWNS!

You can get the "best breaks" in rock reduction if AMERICAN Hammermills and Ringmills are on the job.

These machines are designed and built to handle the toughest crushing operations. Extremely low power and maintenance requirements give your production profits a real "helping hand."

AMERICAN Crushers deliver 10 to 100 tons per hour, *continuously*—with the product reduced to uniform size, free of chips and slivers.

Write for Information

AMERICAN PULVERIZER COMPANY
1289 MACKLIND AVE. ST. LOUIS, MO.

Screening for Profit

WITH LINK-BELT VIBRATING SCREENS

● Hundreds of Link-Belt vibrating screen installations are proving their efficiency in screening for profit—handling a large variety of materials, such as sand, stone, gravel, coal, fertilizer, ores, grain, oil well drilling mud, chemicals, removing solids from factory wastewater, etc. Send for Book No. 1562.

Return Coupon for This Book

LINK-BELT COMPANY, 2045 W. Hunting Park Ave., Philadelphia, or nearest office. 7670-A

☐ Send Vibrating Screen Book No. 1562
☐ We are interested in a screen for _____
Name _____
Address _____
City _____ State _____

BITUMINIZED AGGREGATE

P-A TYPE PORTABLE PLANT

MODERN STATIONARY AND PORTABLE MIXING PLANTS OFFER A NEW OUTLET FOR AGGREGATE PRODUCERS

SEND FOR DESCRIPTIVE LITERATURE

HETHERINGTON & BERNER INC.
ENGINEERS AND MANUFACTURERS
701-745 KENTUCKY AVENUE • INDIANAPOLIS, INDIANA

The Sign of a GOOD DISTRIBUTOR

UNION Wire Ropes

The "ULTIMATE LOW COST WIRE ROPE"

PAY LOADS *and* PROFITS

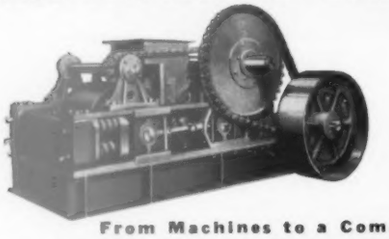
No ordinary buckets are the Industrial Brownhoist Clamshells. From tip to digging teeth they are as finely built as thirty years experience and modern engineering makes possible. The result . . . out on your work . . . is bigger output, lower upkeep cost and, most important, increased profits.

Your operator will get the most out of his crane when it's equipped with an Industrial Brownhoist Clamshell . . . and you'll get a bigger return on your crane investment. Complete facts are contained in Catalog 353. Want a copy?

INDUSTRIAL BROWNHOIST

GENERAL OFFICES: BAY CITY, MICHIGAN
DISTRICT OFFICES
New York, Philadelphia, Pittsburgh, Cleveland, Chicago.

HIGH PRODUCTION--LOW POWER COST



ROLL CRUSHERS
SIZES UP TO 36 x 20

JAW CRUSHERS
SCREENS
PORTABLE PLANTS
CONVEYORS
ELEVATORS
LOADERS

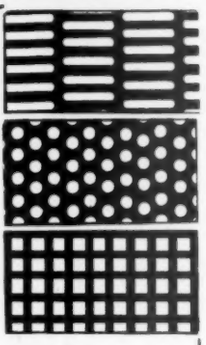
From Machines to a Complete Plant
Catalogs and Plans for the Asking

DIAMOND IRON WORKS INC.
AND THE MAHR MANUFACTURING CO. DIVISION
MINNEAPOLIS, MINNESOTA, U. S. A.

MEMO

Send next inquiry on perforated metal to

For PRICE
QUALITY
SERVICE
ACCURACY
Specify
"STANDARD"
SCREENS



ROUND-SQUARE-SLOTS
Accurate Size—Less Blinding
Longer Wear—Less Repair
We can Perforate up to 1" Thick
LARGE STOCK OF RAW MATERIAL FOR QUICK SHIPMENT
Inquiries Promptly Answered

STANDARD STAMPING & PERFORATING CO.
49th Place & Kedzie Ave. CHICAGO, ILL.

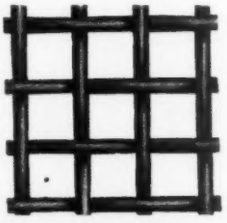
A Fraction of an Inch May Be Ruining Your Profits—

Screens, if just a fraction off-size, can load a world of grief on your shoulders!

Prevent complaints, rejections, broken contracts—use

"TWIN CITY" SCREENS.

ACCURATE to a hair—DURABLE as a pig's nose—they'll help keep your costs down and your volume up.



Write the
TWIN CITY IRON & WIRE COMPANY
Saint Paul **Minnesota**

Ask for Catalog No. 39

ROTARY KILNS
GRINDING MACHINERY

for cement, lime, ores, etc.

F. L. SMIDTH & CO.
225 Broadway New York, N. Y.

CONVEYING SYSTEMS FOR PULVERIZED, FINE, CRUSHED & GRANULAR MATERIALS

FULLER-KINYON—FLUXO—AIRVEYOR

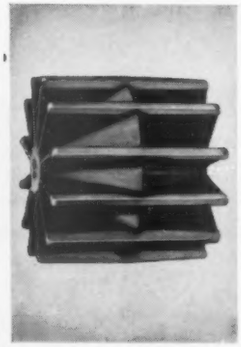
AIR-QUENCHING COOLERS

FULLER ROTARY COMPRESSORS AND VACUUM PUMPS

ROTARY FEEDERS - DISCHARGE GATES

BIN SIGNALS

FULLER COMPANY
CATASAUQUA, PENNSYLVANIA
Chicago: Marquette Bldg. San Francisco: Chancery Bldg.



DOUBLES
THE LIFE OF CONVEYOR BELTS!

The most profitable investment in conveyor equipment! A pulley that saves at least 50% on conveyor belts! This exclusive Sprout-Waldron development prevents material from coming between the face of the pulley and the belt . . . eliminates the heavy friction wear and punching of holes. Interchangeable with standard pulleys. *Write for list of sizes available.*

SPROUT, WALDRON & CO., INC.
136 SHERMAN ST. MUNCY, PA.

ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT

Consolidated begins 1940 with the purchase of a 1,000,000 bbl. Cement Plant

MOVING RAPIDLY

LIQUIDATION

of the Machinery, Equipment, Buildings of

CASTALIA PORTLAND CEMENT CO.

Castalia, Ohio (2 Miles from Sandusky and 50 Miles West of Cleveland)

ROTARY KILNS

2—8′x125′ Reeves Bros. Rotary Kilns, each equipped with ¾″ thick steel shell, triple riveted on ¾″ circumferential butt straps, double riveted longitudinal with ¾″ straps. Supporting rolls are the cradle or equalizing type with four rolls per tire; 15″ face tires; 13″ face girth gear. Each kiln is equipped with firing hood on wheels; one spare extra new girth gear and two rolls with shafts. In excellent condition with no bulges or other defects in shell, in the hot zone or elsewhere.

5—6′x120′ Rotary Kilns, each with ½″ steel plate shell, firing hood on wheels, 8″ face tires, 9″ girth gear, double riveted, butt strapped, single roller trunnions or two rolls per tire.

5—6′x60′ Rotary Kilns; specifications same as 6′x120′ kilns.

ROTARY DRYERS

3—6′x60′ Direct Heat Rotary Dryers.
1—4′6″x50′, Direct Heat Rotary, double shell.
1—4′x60′ Rotary Dryer or Cooler, made by Bonnot Co., Canton, Ohio; ½″ shell.

MACHINE SHOP

Quick Change Engine Lathes, Key Seater, Shaper, Planer, Threading Machine, Forcing Press, Drills, Emery Grinder, Hack-Saw, Milling Machine, Electric Welder, Wrenches, Reamers, Hoists, etc.

LOCOMOTIVES

4—18 ton Steam Industrial Locomotives (3—Porter and 1—Vulcan); 36″ gauge, 10″x16″ cylinders, saddle tank type; each with locomotive tender, having Blakeslee jack pump.

DUMP CARS

391—1½ yd Atlas type, two-way; 36″ gauge, steel bodies.

INDUSTRIAL TRACK

7 Miles of Industrial Track; 2 miles with 60 lb. rail, 5 miles 40 lb. rail, with 37 switches and frogs.

BOILER PLANT

2—250 HP Heine Horizontal Water-Tube Boilers; 1—5′x100′ high x ¼″ steel stack; including boiler feed pumps, steam pumps, water purifier, etc.

Attention: Plant Owners!

THE EQUIPMENT IS SO DIVERSIFIED AS TO BE APPLICABLE TO EVERY KIND OF CHEMICAL PROCESS OR INDUSTRIAL MANUFACTURING PLANT!

Prices are purposely set low to obtain quick action. We urge your immediate inspection. Representative is on premises with full authority to sell.

SPECIAL

(Not at Castalia Plant)

7-FT. SYMONS CONE CRUSHER

Fitted with Fine Bowl.
For Immediate Shipment
at Large Savings.

LABORATORY

Tyler Rotap Testing Screen, Fairbanks Cement Tester, Electric Muffle Furnace, Analytical Balance, Disc Grinder, Miscellaneous Glassware, etc.

PUMPS

15—Centrifugal Pumps; 3″, 4″, 5″, 6″ with direct connected motors, except three with gasoline engine drive.

TRAVELING CRANE & RUNWAY

1—5 ton Harnischfeger Traveling Crane and 300 ft. long Runway. Crane is 20,000 lbs. capacity, 70′ span, equipped with 3—25 H.P. and 1—7½ H.P. G.E. a.c. motors. Included is a 1½ yd. bucket.

LOCOMOTIVE CRANE

1—20 ton Browning No. 8 Locomotive Crane, with 40′ boom and 1¼ yd. bucket. No. 8 wheels. 40,800 lbs. at 14′ r.

MISCELLANEOUS

3—42″ Fuller-Lehigh Pulverizers, gear driven, with direct connected 75 H.P., 3/60/440 v. 514 RPM. motors.

1—30″ Ohio Electric Magnet, with motor gen. set for operating it.

1—24″x24″ Jeffrey Single Roll Crusher.

1—60″ Exhaust Fan, with 36″x18″ wheel.

2—Car Pullers, each with direct connected 10 H.P. motors, with 150′ ⅝″ cable.

1—Car Puller, single drum, with 600:40 James Reducer and 10 H.P. motor.

1—Pennsylvania Hammer Mill, SXR-46, made by Pennsylvania Crusher Co., Philadelphia, Pa. Steel frame, tramp iron separator, quick adjusting cage, ball and socket self-aligning bearings, adjustable breaker plate; hopper 2′10″x1′3″ wide; 60-70 H.P., 1000 RPM; floor space 5′9″ x 8′4″.

2—¾ yd. Erie Type "B" Crawler Steam Shovels.

1—12′ dia. Dry Grinding Pan, Phillips & McLaren, 60″x16″ mullers, steel tires.

1—Apron Pan Feeder, 36″ wide x 11′6″ c/c, with roller chain drive, 600:40 James reducer and 10 H.P. Lincoln motor.

BALL AND TUBE MILLS

2—5′x22′ Allis-Chalmers.
3—5′x22′ Bonnot Co., Canton, Ohio.
1—5′x23′ Bonnot Co., Canton, Ohio.
All silex lined, equipped with CAST STEEL HEADS, steel gears and direct geared to 150 H.P., G.E. slip ring motors, 585 RPM.

6—5′x27′ Tube Mills, roller mounted. Silex lined, with 200 H.P. slip ring motors, 585 RPM.

1—8′ x 30″ Hardinge Conical Ball Mill, Ti-tanite lined, with 175 H.P., 600 RPM. slip ring motor.

3—5′x12′ Bonnot Ball Mills, cast steel heads, steel lined, with 150 H.P., 600 RPM. motors.

MISCELLANEOUS

2—6′x5′ Tyler Hummer Screens, made up of 3′x5′ screens, double deck; Nos. 1102 and 1103; type 31, with screw feeder.

1—Motor Generator Set for operating Tyler Screens.

800 Ft.—12″ Screw Conveyor, steel encased, in assorted lengths of 21′, 23′, 25′, 50′, 60′, 80′, 104′ and 106′.

44—9″x29′ long Screw Conveyors, also one each 9′, 22′ and 32′.

3—30″ Belt Conveyors; 2—34′ c/c, flat with rubber belt; 1—70′ c/c, flat with canvas belt.

1—36″ Stedman 3-cage Disintegrator. Shop #D-946.

1—Ingersoll-Rand Imperial type 10 Air Compressor; steam, 10″ & 16″x14″; air 10x14″.

7—Portable Garages, galv. steel, one car.

1—4″x8″ Jaw Crusher, Sturtevant Mill Co.

1—50′x100′ Steel Building, with corrugated siding and roofing, 22′ to eaves.

40—Steel Lockers, Durand, 15″x15″x6′.

1—72″ Volume Blower, 42″x24″ wheel with direct connected 60 H.P. motor.

17—Slurry Mixing Tanks, 10′ dia. x 15′, 8800 gal., wood, with agitators.

2—Dust Collectors; 1—3 compartment, by Dust Recovery & Conveying Co., and 1—6 compartment Norblo, made by Northern Blower Co. — each complete with fans, shaking device, steel supports, etc.

8—Bucket Elevators, chain, steel enclosed, malleable buckets. (Full listing in circular.)

ELECTRIC MOTORS

4300 Horsepower in Electric Motors, all 3 Phase, 60 Cycles, 440 Volts. Included are 9—150 H.P. and 6—200 H.P. slip ring; 585 RPM. Shop numbers 5166879, etc.

Send for Your Copy of Illustrated Bulletin
WIRE—PHONE—WRITE

Address All Inquiries to:

CONSOLIDATED PRODUCTS CO., INC.

P. O. BOX 545, SANDUSKY, OHIO—PHONE CASTALIA 4331

8 A Telsmith Gyratory Crusher-Mang. Equipt - Steel frame-oiling system and pulley..... $700.00
50 HP-A.C.-B.B. motor with slide rails with Pot. Starter—3P-60C-440V 250.00
6x5 A.C. Cent. Pump—D.S. type S. J. with 75 HP Motor and Pot. Starter—3P-60C-440V ... 400.00
50 HP Wisconsin power units, never used, house and gas tank — H. D. IND. Radiator. Each 300.00
48"x12' Telsmith H. D. scalping screen — screen sections 1½" and 2¼" holes..... 400.00
1 yd. Drag scraper hoist—variable speed 400.00

FRED T. KERN CO.
P. O. Box 2057 Milwaukee, Wisc.

FOR SALE BY OWNER

Sacrifice to settle Estate. Greely Quarry, at Russellville, Kentucky. Inexhaustible supply of hard, high-grade calcium carbonate Grade A stone. 30 foot face above crusher floor. Dump direct to large Primary. No Water. No Incline. 50 acres practically free of any overburden. Present plant and equipment consisting of No. 9 Primary, 1½ yard shovel, 25 ton crane, compressor, conveyors, elevators, cars, 14-car concrete tipple, unlimited ground storage. Cheap power, either electric or steam, affords most economical production of crushed, building, chemical and Riprap stone, agricultural lime and chemical lime of any quarry in Southern and Western Kentucky. Unlimited sales possibilities throughout greater part of all Western Tennessee as well as Western Kentucky. Send inquiries to

Box 104
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

SLIP RING MOTORS

75 HP. 1800 RPM. 3/60/440 General Elec. MT
75 HP. 720 RPM. 3/60/220 General Elec. MT
100 HP. 720 RPM. 3/60/220 Westinghouse CW
150 HP. 900 RPM. 3/60/440 General Elec. IM
150 HP. 720 RPM. 3/60/2200 General Elec. MT
150 HP. 580 RPM. 3/60/220 Westinghouse CW

SYNCHRONOUS MOTOR

220 HP. 900 RPM. 3/60/220 General Elec. ATI

AC GENERATORS

85 KVA. 1200 RPM. 3/60/220 Allis-Chalmers
300 KVA. 600 RPM. 3/60/440 General Electric

GASOLINE GENERATOR

5 KVA. 3/60/220 V. AC generator—LeRoi engine

AIR COMPRESSORS

9x 8 Chicago Pneumatic type NSB horizontal
9x10 Sullivan class WG3 horizontal

CENTRIFUGAL PUMPS

6" Lane-Bowler 25 HP. 3/60/220 V. Gen. Elec. mtr.
12" Cameron Volute 4170 GPM. 170' head. 250 HP. 3/60/440 V. Gen. Elec. slip ring motor

GASOLINE ENGINES

10 HP. 350 RPM. Fairbanks-Morse type Z
25 HP. 240 RPM. Victor International, clutch pulley

ROCKFORD ELECTRIC EQUIPMENT CO.
726 South Wyman St. Rockford, Illinois

FOR SALE
DIESEL POWERED DREDGE

With copper bearing steel hull and cabin, fully equipped. Ready for work. Two diesel engines, one 180 H. P. and one 54 H. P. On Sale through receivership. Original investment approximately $75,000.00. In first class state of repair. If interested, write

HARRY J. LIPPMAN
910 Majestic Bldg.
Detroit, Mich.

FOR SALE

1— ¾ yd. Hayward orange peel bucket.
1— ¾ yd. D-36 Owen.
1— ¾ yd. Page dragline.
1— ¾ yd. Williams.
1— ¼ yd. Type M Owen.
1—1 yd. Blaw Knox.
1—1½ yd. Sauerman electric scraper outfit.
1— ¾ yd. Page scraper bucket.
1—2'x4' Niagara double deck vibrating screen.

THE W. T. WALSH EQUIPMENT CO.
3088 West 106th St. Cleveland, Ohio

GRAVEL PIT & QUARRY OWNERS HERES YOUR CHANCE

SHIPPED TO US FOR SALE BY RECEIVER — MUST BE LIQUIDATED IN 30 DAYS.

2—P&H cranes—cap., ¾ yd., with 40 ft. boom. Both in excellent condition.

1—Allis-Chalmers 12" jaw crusher.

RENNOLDS EQUIPMENT CO.
13908 S. Halsted St., Chicago, Ill.
Tel. Riverdale 139

AERIAL-TRAMWAY

Continuous — Bicable — 2⅓ Mis. Lg. Mfgr.—American Bleichert comprises principally—21 steel towers stationary and traveling cables 62 ea. 30 cu. ft. buckets—loading and discharge terminals—50 H. P. motor designed to handle 75M/125M lbs. coal per hour.

Complete—Erected—In Good Condition

Apply For Particulars

JOHN D. CRAWBUCK COMPANY
EMPIRE BUILDING *Engineers—Sale Agents* PITTSBURGH, PA.

LIQUIDATING

Misc. Plant Equipment—Located So. Michigan

Universal gas cat. full revolving crane, 28' boom.
Barber-Greene Belt Conveyors—24"x60'—80'—90'.
Vib. Screens—A-C 2 deck 4x8. Simplicity 3 deck 3x6.
Johnson 79 yd. can, 2 compartment material bin.
9x20 Iowa complete portable plant, inc. power.
Haiss Loader. Log Washer, 24x20. Bucket Elevator, 16x30. Jaw Crusher, 7x12. Plate Feeder, etc.

JAMES WOOD, 53 West Jackson Blvd., Chicago, Ill.

We specialize in the engineering and sales of rebuilt used equipment as follows:

Air Compressors
Cranes, Overhead Electric, Traveling
Crushers
Hoists
Motors
Transformers

We solicit your inquiries.

GEORGE M. MERIWETHER
Industrial Equipment
606 Farley Bldg. Birmingham, Ala.

LATE MODEL BARGAINS

P&H ½ yd. crane, 35' boom, used 3 months.
NORTHWEST 1¼ yd. crane, high gantry, 45' boom, longer if desired, latest style crawlers, excellent condition.
CEDAR RAPIDS Crusher, 9 x 16.

HUNTER TRACTOR & MACHINERY CO.
329 So. 16th Street
Milwaukee Wisconsin

FOR SALE

1 P&H, 206B clamshell. Good condition. Price $1,750 F.O.B. plant, Tuskegee.

TUSKEGEE SAND AND GRAVEL CO.
Tuskegee, Alabama

FOR SALE CHEAP

One 5-Ton (at 12' radius) Orton Crane, gasoline powered, 30' boom, ½ cu. yd. clam shell bucket, mounted on 5-Ton Sterling truck. Price $750. Located in Pittsburgh District. Address Owner

BOX 304
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

Morris 6" water pump.
200'-8" water pipe.
2—Electric motors.
1 Yard Page Bucket.

NORTHWESTERN GRAVEL CO.
Lake View, Iowa

FOR SALE

GASOLINE LOCOMOTIVE CRANE, Orton, 12 to 15 tons capacity, 8 wheel, 40 or 50 ft. boom.
ELECTRIC SHOVEL OR CRANE, crawler type, one yd. capacity or 15 tons at 12 ft. rad.
LOCOMOTIVE CRANE, steam, 15 to 50 tons capacity.

P. A. HENAULT
2140 Book Bldg. Detroit, Mich.

FOR SALE

8-B Telsmith gyratory crusher.
No. 32 Telsmith reduction crusher.
50 HP D.C. Aurora centrifugal water pump.
¾ yd. Brownhoist combination crane and shovel.
5 yd. Austin-Western scoop.

COOGAN GRAVEL COMPANY
805-b Lehmann Bldg.
Peoria - - - - - - - - - Illinois

QUARRY EQUIPMENT

Marianna, Fla. (near Dothan, Ala.)
Will sacrifice for quick sale

240 Fairbanks-Morse diesel engine, fully equipt.
300 ton pr. hr. Williams No. 8 hammer mill.
3 track miles 56-60 lb. rails.
Nine McLanahan type knob roll crushers.
⅞ yd. Erie steam caterpillar shovel.
Two 75 H.P. A.C. motors. 220-2200 volts.
Conveyors, hoists, silent chain & sprockets, etc.

P. O. Box 1711 **W. M. SMITH & CO.** Birmingham, Ala.

FOR SALE

Used gasoline engine driven portable air compressors, all sizes.

Two FMQ Ingersoll wagon drills.

WESTERN CONTRACTORS SUPPLY CO.
3145 W. Lake St. Chicago, Illinois

FOR SALE

2—Sturtevant Vertical Engines, Type V 57, Size 9x9, 250 RPM, Steam pressure 150.
8—Sturtevant Engines, Type V 57, Size 6x7, 400 RPM, Steam pressure 160.
2—Roots Rotary Pumps, belt driven, Size 21, Cap. 20,000 GPH at 165 RPM, Head on discharge 55 ft.
2—Roots Rotary Pumps, direct connected to Sturtevant Vertical Engines, Type V 57, Size 7x7, Steam pressure 150, RPM 200, Cap. 30,000 GPH at 200 RPM.

STANDARD EQUIPMENT & SALVAGE CO.
2501 First Avenue, North
Birmingham, Alabama

FOR SALE

One Number 8 Allis-Chalmers Gyratory Crusher.
One Number 6 Allis-Chalmers Gyratory Crusher.

M. S. ROSEN
P. O. Box 371 Albany, N. Y.

100000 ITEMS

- Motors
- Generators
- Transformers
- M G Sets

Wire—Write—Phone

ERIE ELECTRIC MOTOR REPAIR CO., INC.
124 Church St. Buffalo, N.Y.

CEDAR RAPIDS portable bituminous road mix plant, late model, like new.
PIONEER 300W portable wheel type sand and gravel crushing, screening and washing plant.
ORTON ¾ yd. full rev. gas cat. crane, 35' boom and bkt., ready to work; $1650.
BUCKEYE ¾ yd. rev. gas cat. crane-drgl., $1650.
TRAYLOR 48x60 jaw crusher, good cond., West.
BESSEMER & F-M Diesel engs. and gen. sets, 420, 360, 240, 180, 150 and 60 H.P.
MILWAUKEE gas locomotives, (3)—7 ton, 30" ga., good cond., $700 ea.; also larger locos.

H. Y. SMITH CO., 828 N. Broadway, Milwaukee, Wis.

FOR SALE OR RENT

Compressor, Sullivan angle compound 13-8x8, capacity 406 c.f.m., mounted on structural steel base and skids with A.C. Wagner 220 volt, 3 ph se 60 cycle motor. Excellent condition.

Also selection of 105', 210' and 310' portable compressors.

O. B. AVERY COMPANY
1325 Macklind Ave. St. Louis, Mo.

BARGAINS

3 cu. yd. Diesel Dragline 100' Boom.
100 HP Kewanee 125 lb. Portable Boiler.
200 KW 240 V. AC Gen. D/C Corl. Eng.
220 KW Rotary Converter & Sub-Station.
Motors—Diesels—Compressors—Unaflows.
For EQUIPMENT—All Kinds—Try

H. & P. MACHINERY COMPANY
5819 Enright Ave. St. Louis, Mo.

EXTRA SPECIAL

LIQUIDATION PRICES IMMEDIATE DISPOSAL

CASH OR TERMS

2500 ft. (NEW) RUBBER CONVEYOR BELT—500 ft. Rolls—5 ply—1/8" Rubber Top.
1—2 yd. MEAD MORRISON REHANDLING CLAM-SHELL BUCKET—like new.
1—1/2 yd. HAYWARD DIGGING BUCKET.
1—1¼ yd. HAYWARD REHANDLING BUCKET.
2—1¼ yd. HAISS REHANDLING BUCKETS.
1—1¼ yd. HAYWARD DIGGING BUCKET.
2—1½ yd. HAYWARD REHANDLING BUCKETS.
1—1½ yd. HAISS DIGGING BUCKET.
2—LAIDLAW, DUNN, GORDON WORKS AIR COMPRESSORS—Duplex—Single Stage—Belt Driven—Feather Valve—Horizontal—size 13x16x13—1070 cu. ft. per minute—220 RPM—HP required: 150 HP at 80 lbs. pressure—172 HP at 100 lbs. pressure serial #23,834 and 23,835—pulley: 80" dia. by 25" face—machines are still on original foundations—no belt, motor, intake unloader, or air receiver.
1—630' CHICAGO PNEUMATIC DIESEL DRIVEN AIR COMPRESSOR—664' displacement—120 lbs. pressure—type RH-40-D—120 HP—323 RPM—type MWM-BENZ—Serial #19973.
1—CHICAGO PNEUMATIC AIR COMPRESSOR—Vertical—2 stage—100 lb. working pressure—type VC—16" dia. low pressure—10" dia. high pressure—10" stroke—257 RPM—fitted with 3 step unloader—control and vertical intercooler—each direct connected to 100 HP ANDERSON DIESEL ENGINES—type KD—heavy duty 2 cycle—solid ejection—257 RPM.
15—310' INGERSOLL-RAND AIR COMPRESSORS—with GU WAUKESHA MOTORS—mounted on Mack Truck—equipped with dual pneumatic tires in back—has two tool boxes made of oak—one on each side—for holding steel—jackhammers, concrete breakers, hose. If portable desired, have wheels and axles.
1—15 ton MORGAN OET CRANE—250 volts—DC Current—3 motor drive—58'6" Span—fishbolly type—cab control—main hoist motor 25 HP—type 48-A—Bridge motor 25 HP—type 48-A—Main trolley motor 5 HP size 4-L.
1—BROWNING HOIST ELECTRIC OPERATED LOCOMOTIVE CRANE—mounted on 4 wheels—width of track 7'3"—especially designed as a GANTRY CRANE—to be operated on an overhead trestle for unloading barges.
1—P&H ¾ yd. CATERPILLAR CRANE—40 ft. boom—gasoline operated.
1—MODEL 501 KOEHRING GASOLINE DRIVEN CATERPILLAR CRANE—60 ft. boom.
1—BYERS ¾ yd. FULL REVOLVING CRANE.
1—MODEL 301 KOEHRING GASOLINE DRIVEN CATERPILLAR CRANE—40 ft. boom.
1—NORTHWEST MODEL 105 GASOLINE DRIVEN CATERPILLAR CRANE.
2—MODEL 750 LIMA SHOVELS—1¾ yd. capacity—gasoline operated—new 1937.
1—2 yd. P&H SHOVEL—Diesel operated—new 1938.
1—HOAR TUNNEL AIR SHOVEL—mounted 36" gauge wheels.
1—WELLMAN-SEAVER-MORGAN DOUBLE DRUM, DOUBLE FRICTION MINE TYPE HOIST—drum dia. 42"—drum face 30"—This is in excellent condition but will need a few minor repairs.
1—TRAYLOR BULLDOG GYRATORY CRUSHER—type T—#12125—The size of this crusher is 8", that is, the opening is 8"—this crusher is in excellent shape.
1—BACON-FARRELL JAW CRUSHER 46"x18"—this is in excellent condition and is ready to run.
2—HORIZONTAL TYPE 48" SYMONS DISC CRUSHERS—manufactured by CHALMERS AND WILLIAMS.

1—CAMERON #6 Sinking Pump.
4—1500 HP DIESEL ENGINES—marine type, direct reversing—complete with spare parts—bore 15.75—stroke 18.1105—9 cylinders—type 4 cycle solid injection—435 RPM—engine BHP 1535—fuel consumption full load .402 P.S.H.P. hour minimum—air starting pressure 150 sq. inches. Lowest speed idling 100 RPM—average exhaust temperature 950° F.—practically new.
1—200 HP GARDNER DIESEL ENGINES—11½" bore—15" stroke—4 cylinder—solid injection—320 RPM—direct reversing—marine or stationary.
1—150 HP CHICAGO PNEUMATIC 3 cylinder—400 RPM—Solid injection—with generator shaft and outboard bearing—model RHB-50D.
1—225 HP WINTON—360 RPM—equipped with clutches—hooked up to generator 150 KW—AC Current—3 phase—60 cycle—600 volts—V belt exciter—6 cylinder—air injection—22,000 lbs.—originally designed for 300 HP at 450 RPM.
1—150 HP FAIRBANKS-MORSE DIESEL—8¾" bore—10½" stroke—5 cylinder—model 44HD—solid injection—2 cycle—450 RPM—complete with water cooler and oil cooler—air compressor—with 2 tanks—complete set of gauges—parometer and all pipe fittings.
1—400 HP INGERSOLL-RAND DIESEL ENGINE—4 cylinder—4 cycle—17¾"x22" Vertical—225 RPM—direct connected to 275 KW or 340 KVA—General Electric 3 phase—60 cycle—2300 volts—50 degrees—continuous duty—type AT-1 32-343-225—form E86-ZA—no exciter—complete with switch board and instruments.
2—270 HP CHICAGO PNEUMATIC LATE MODEL DIESELS—360 RPM—solid injection—with generator shaft and outboard bearings—Model RHB-45-S—6 cylinder.
1—EUCLID BOTTOM DUMP TRAC-TRUCK—12 yd. water level capacity—Waukesha Engine—Engine #6SRL7—Engine #200375.
2—EUCLID END DUMP TRUCKS—8 yd. water level capacity—truck #22W40—motor model 6SVK89D—motor #356558—motor make Waukesha: motor model RXC-010-006 motor #122331—motor make Hercules.
6—EUCLID CATERPILLAR MOUNTED BOTTOM DUMP CRAWLER WAGONS.
50—2 yd. SIDE DUMP STEEL KOPPEL CARS—35" gauge.
3—NATIONAL STEAM HOISTS with boiler attached—in A1 condition—size 81/4x10—double friction—friction drum—with attached swinging gear—boilers built according to National Code—carried steam pressure of 125 lbs.—were built to withstand rigorous work in Granite Quarry.
6—MUNDY MINE HOISTS—single drum—with 5 ft. drums—48" wide to handle 1" cable—each of the hoists are powered with 30 HP Crocker Wheeler 3 phase—60 cycle—220 volt motors—geared very low—complete with all electrical equipment—actually used less than 2000 hours—fitted with automatically controlled electric brakes.
3—P&H MONORAIL OVERHEAD TRAVELING HOISTS—2 motor drive—3 phase—60 cycle—220 volts.
10—TRANSIT MIX TRUCKS—5 cu. yd. capacity—mix while in transit—load from top and unload automatically—mixers and trucks completely rebuilt—new pneumatic tires throughout—photograph and full description on application—will sell on time.
3—BARBER-GREENE CATERPILLAR MOUNTED FLIGHT LOADERS—gasoline operated.
1—12 ton MIDWEST locomotive—36" gauge—gasoline driven.

2—5 ton WHITCOMB locomotives—36" gauge—gasoline driven.
1—Midwest locomotive—14 ton—36" gauge—gasoline driven.
1—Vulcan 36" gauge—14 ton locomotive—gasoline driven.
2—6 ton capacity electric battery locomotives—36" gauge.
1—HOBART ARCWELDER—10 HP motor 1750 RPM—3 phase—60 cycle—440 volts—24-12 amps. generator—150 amps. 40 volt—serial #BW1431.
2—GENERAL ELECTRIC Welders—220 volt—43 amps.—full load—60 cycle—3 phase—model 6WD23A1—type WD23—generators 25 volt—300 amps. 1750 RPM.
1—150 ton—3 compartment—BLAW-KNOX HOPPER—with weighing scales and bucket elevator.
1—3 drum hoist—10¼x9—with boiler and separate swinger.
1—Lidgerwood double drum hoist—10¼x8—with boiler.
10—Gasoline and Diesel Driven BULLDOZERS from 2 to 10 ton capacity.
1—7 ton HUBER THREE WHEELROAD ROLLER—gasoline driven—with scarifier.
1—10 ton GALION THREE WHEEL ROAD ROLLER—gasoline driven—with scarifier.
1—Model 60 CATERPILLAR TRACTOR with CHAUTE LaPLANTE BULLDOZER.
1—Model 30 CATERPILLAR TRACTOR WITH BULLDOZER attached—4 cylinder engine.
1—Model 50 MONARCH TRACTOR with Bulldozer—4 cylinder—Stearns Motor.
1—Model 40 CLETRAC TRACTOR—with Bulldozer—6 cylinder—complete with starter and generator.
1—500 HP ERIE WATER TUBE BOILER—A.S.M.E. Code—2 drum—Horizontal—Drums 36" dia., by 20 ft. long—281 3½" tubes—Boiler built in 1924—last inspection August, 1938—165 lbs. pressure—completes with Jones Underfed Stokers—loaded hoppers and two SMITH-VAILE BOILER FEED PUMPS outside plunger packed—insured by Hartford Insurance Co.—located Pennsylvania.
1—LINK-BELT BOILER—built by Link-Belt Co.—#H.S.B69—Massachusetts Standard #55—A.S.M.E. Code 70 HP—Vertical.
1—LIDGERWOOD BOILER—Boiler #02440—plate #17790—Manufactured Lidgerwood Co., New York—A.S.M.E. Code—NYS Std. 350 #—Wisconsin Std. 193 #—Michigan Std. 371 #—New Jersey Std. 91 #—California Std. 210 #—Ohio Std. 898 #—Penna. Std. 786—40 HP vertical.
1—NATIONAL BOILER—Manufactured by National Engine Hoisting Co., New Jersey—built in 1925—plate #13762—boiler #4464—40 HP—vertical.
50—CLAY SPADERS—Manufactured by Ingersoll-Rand and Chicago Pneumatic—rebuilt and in guaranteed good order.
25—INGERSOLL-RAND DRIFTER DRILLS—Type IR-72.
2—INGERSOLL-RAND WAGON DRILLS—type X-71.
6—X-59 JACKHAMMERS—INGERSOLL-RAND.
25—BCR-430 JACKHAMMERS.
5—INGERSOLL-RAND S-49 JACKHAMMERS.
20—INGERSOLL-RAND S-68 JACKHAMMERS.
27—INGERSOLL-RAND DRIFTER DRILLS—S-70.
15—INGERSOLL-RAND DRIFTER DRILLS—DA-30.
1—INGERSOLL-RAND DRIFTER DRILL—S-70—new.
1—CLEVELAND WAGON DRILL—Serial #6-FW-6550—with Cleveland drill—model D-14-DR—Serial #6-AZ-5258.
1—250 HP WESTINGHOUSE MOTOR—3 phase—60 cycle—440 volts—290 amps. 380 RPM at full load—type MS.
1—150 HP ALLIS-CHALMERS—volts full load 120—amps. 29—RPM 900—serial #48356.

Thousand other items too numerous to mention.

If it is something that a contractor can use we have it at a very great reduction price. We guarantee a quotation on any item in used contractor's equipment at a very great saving. We are always in the market to buy complete contractors plants.

BROOKLYN CONTRACTORS MACHINERY EXCHANGE, INC.

1415 Bergen Street — Phone: PResident 3-7946—7777 — Brooklyn, New York

---

LOCOMOTIVES

CARS, BUCKETS, CRUSHERS, CONVEYORS, HOISTING EQUIPMENT, MOTORS, GENERATORS, HYDRAULIC WHEEL PRESSES.

Buy, Sell, or Exchange

Industrial Equipment Corp.

P. O. Box 1647 — Warehouse
Pittsburgh, Pa. — Carnegie, Pa.

FOR SALE

1—4'0" x 30'0" Rotary Dryer

McDERMOTT BROS. CO.

Allentown — Pennsylvania

Modern Equipment—Priced Right!!

AIR COMPRESSORS

7—Portable compressors gasoline drive from 110 to 315 cu. ft.
8—Stationary Electric and Diesel from 450 to 2600 cu. ft. High pressure type.

CRANES, DRAGLINES AND SHOVELS

1—Bucyrus-Erie Dragline 55-B, 80' boom, 2½ yd. bucket, Diesel, 1935.
1—Lima Dragline, 70' boom, 2½ yd. bucket Diesel. 1936. Capacity as crane 52-tons at 12' radius.
1—Link Belt K-55 Dragline, 70' boom, 2½ yard bucket—gasoline, 1933. Capacity as crane 40-tons at 12' radius.
1—No. 8 Northwest Dragline, 80' boom, 2 yard bucket—gasoline, 1939.
1—Bucyrus-Erie 43-B Special Combination 2 yd. Shovel and Dragline, Diesel, 1935.
1—Bucyrus-Erie 43-B Crane, 60' boom, 1½ yd. Bucket, Gasoline, 1935. Capacity as crane 40-tons at 12' radius.
1—Koehring Model 501—1¼ Yard. Combination Shovel Crane—Gasoline. Capacity as crane 15-tons at 12'.
1—Industrial Brownhoist 15-Ton Crane, 60' Boom. Gasoline.
1—Brownhoist Crane 45' Boom, 12-tons capacity—gasoline.
1—Little General Shovel and Crane, ½ yd. capacity—Gasoline.
1—40-ton Ohio Steam Locomotive Crane—60' Boom.
1—30-ton Browning Steam Locomotive Crane.
1—25-ton Browning Steam Locomotive Crane.

BUCKETS

8—Clamshell, Dragline and Orange Peel 1½ to 2 cu. yds.

DERRICKS

1—Steel Stiff Leg Derrick—60 tons capacity at 40' radius with 87' boom.
2—American Steel Stiff Leg, 10 Tons Capacity 100' Booms.
3—American Guy Derricks—15 Ton Capacity 115' masts, 100' booms.

HOISTS

6—Electric from 30 H. P. to 100 H. P. single, double and triple drum with and without swingers.
8—Gasoline from 15 to 80 H. P. single and double drum.
1—Lambert 10x12 3-drum Steam Hoist.

ATLANTIC EQUIPMENT CORP.

50th and Grays Ave. — Tel. Evergreen 6363 — Philadelphia, Pa.

RENT OR SELL

4—3-yard Rex Truck Mixers on Mack Trucks.
2—1½-yard Jaeger Truck Mixers—Ford mounted—Excellent condition.
7—4-yard Rex Truck Mixers mounted on Autocar and Mack Trucks—1937-8.
1—80 ton 2 compartment Blaw-Knox Bin.
Concrete Finishing Machine.
Rent new Diesel 315 Compressor and New Tools.

THE JAEGER-LEMBO MACHINE CORP.

127-04 Northern Boulevard
Corona, L. I., N. Y.
Phone: NEwtown 9-7777

DEPENDABLE MACHINES for rent or sale.
45 H.P. Wisconsin and Continental engines.
Universal truck crane on Mack truck.
Byers Rearcut crane.
Koehring 1¼ yd. dragline.
Trackson shovels, rebuilt, all prices.
Caterpillar 30, with bulldozer.

TRACTOR & EQUIPMENT CO.
433 S. Jefferson St., Chicago
Branch: 2272 S. 7th St., Springfield, Ill.

Crane & Dragline, ⅜ yd., full revolving. Priced low. Shovel boom, sticks, & ¾ yd. dipper for P&H 206, A-1. Coal Conveyor—30' crawler type, gas or electric power. Buckets—⅜ yd. Page, 5/8-1-1¼ yd. Kieslers. 1 yd. Wms. Haiss Loader, overhauled. Several Barber-Greenes. Sauerman Equipment—Hoists, Buckets, etc., ¼ to 5 yds. Reduction Crushers—5" to 10". Rolls 24x14 to 27x58. Portable Plants—9x20 to 9x36. Some include rolls. Gas Locomotives—5 to 30 tons, 24", 36", & Std. gauge. Shovels—Cranes—Drags—⅜ to 8 yd. Diesel—Gas—Elect. Your offers of good used equipment solicited.

JAMES WOOD, 53 West Jackson Blvd., Chicago, Ill.

REAL BARGAINS
FOR SALE OR RENT

1—Northwest dragline model No. 6, with 60 ft. boom, cap. 1½ yd., Murphy Diesel engine, also Kohler light Plant. Ex. condition, 2 yrs. old.
1—Northwest dragline model No. 95, cap. 2½ yd., 65 ft. boom. Murphy Diesel engine. Six months old.
1—Koehring model 501 crane and dragline, cap. 1¼ yd., 40 ft. boom.
1—Northwest crane and dragline, 45 ft. boom, cap. 1¼ yd.
6—Other makes from ½ to 2 yd. Also have mixers, pumps, air compressors, hoists, buckets, conveyors, pile hammers, etc.

RENNOLDS EQUIPMENT CO.
13908 So. Halsted St., Chicago, Ill.
Telephone: Riverdale 139

RECONDITIONED EQUIPMENT

One 80 H.P. Lambert electric three drum hoist, $1200.00
Three 80 H.P. Lidgerwood electric two drum hoists with attached swingers, $900.00 each
Two 72 H.P. Thomas gasoline two drum hoists, $1000.00 each
One 60 H.P. Thomas electric three drum hoist, $975.00
Three Lambert 60 H.P. electric two drum hoists with attached swingers, $800.00 each
One 40 H. P. Thomas gasoline two drum hoist with attached swinger, $650.00
Two Thomas 35 H.P. electric two drum hoists with attached swingers, $600.00 each
One Clyde 25 H.P. electric two speed drag scraper hoist, $500.00
One Sullivan 315′ two stage gasoline portable air compressor, $1800.00
Three Sullivan 310′ gasoline portable air compressors, $650.00 each
Two Sullivan 220′ gasoline portable air compressors, $600.00 each
Two 20 ton American Terry No. 3 guy derricks, with 90′ boom, 80′ mast, $1500 each
One 24″ Portable belt conveyor, 40′ long $ 00.00

Crane Type Motors
3 and 2 phase, 60 cycle, 220 or 440 volts

125 H.P. G.E. 720 R.P.M. $750.00
100 H.P. G.E. 900 R.P.M. $600.00
80 H.P. G.E. 720 R.P.M. $450.00
60 H.P. G.E. 900 R.P.M. $325.00
50 H.P. G.E. 900 R.P.M. $275.00
40 H.P. G.E. 900 R.P.M. $225.00

Large variety of controllers, resistors, switches

UNITED HOISTING CO., INC.
Serving the Construction Industry for 47 Years
175 Locust Avenue, New York, N. Y.

SCRUBBER SCREEN *FOR SALE*

30 Foot by 60 Inch Traylor.

Complete for Belt Drive.

In Good Condition.

SOUTHERN MATERIALS CORP.
NORFOLK VIRGINIA

EQUIPMENT FOR SALE CHEAP

1—Vulcan 40 ton Std. Ga. Saddle tank locomotive.
1—Marion 1 yd. Steam crane 40′ boom on cats.
1—Russell Grader, 10′ Blade.
1—Link-Belt K-30. Trench Hoe Att. 45′ Crane Boom.
1—Link-Belt K-44 shovel 50′ boom, fairleads.
1—Lorain 75 B 1¼ yd. chain crowd shovel.
2—Whitcomb 12 Ton 36″ Gauge Locomotives.
2—C. P. Compressors, 590 cu. ft., 100 h.p. motor.
2—Worthington Compressors, 621 cu. ft., 75 h.p. mtr.
1—Allis-Chalmers 75 Caterpillar Tractor with Bulldozer.
1—Sullivan 310′ portable compressor.
1—Ingersoll-Rand pavement breaker.
6—Easton 4 yd. all steel 36″ Ga. cars.
4000′ of 9″ x 9″ road forms.
1—Ransome 27 E Paver.
2—No. 116 Chicago Pneumatic Paving Breakers.
2—1 yd. Insley bottom dump concrete buckets.
1—Schramm No. 120 Compressor.
1—1 yd. Owen Bucket.
1—1 yd. Kiesler rehandling bucket.
1—¾ yd. Browning clamshell bucket.
1—¾ yd. Blaw-Knox bucket.
1—Le Courtney 6″ Cent. Pump, 40 h.p. motors.
1—Morris 8″ dredge pump, 150 h.p. G.E. motor.
1—Morris 10″ cent. pump, 2250 GPM at 130′ head.
1—Goulds 12″ cent. pump, 50 h.p. G.E. motor.
1—Thompson 6″ self-priming pump, Waukesha motor.
2—Gardner Denver Sheeting Hammers.
2—Humdinger 6″ self-priming pumps, gas motor.
1—Humdinger 4″ self-priming pump.
1—Humdinger 2″ self-priming pump.
1—Domestic double diaphragm pump, gas motor.
1—G.E. motor, 200 h.p. slipring.
2—No. 9 B 2 McKiernan-Terry Hammers.
3—No. 5 McKiernan-Terry Hammers.
3—No. 7 McKiernan-Terry Hammers.

HARRY C. LEWIS
325 Frelinghuysen Avenue Newark, N. J.

CRUSHERS

GYRATORY: 42″ McCully with 80% brand new parts. 36″ Allis-C. 20″ Super. McCully conv. to 16″. Gates Nos. 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.

JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 9x30, 15x36.

REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 40. Traylor 36″ TZ, 8″, 10″, 12″. Super. McCully 6″ & 10″. Newhouse 5, 7 & 10″. Symons Cone & Disc. Ty. 2′ to 4′.

ROLLS: Allis-C. 12½x12, 36x16, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll, Cornish 36x14 & 42x16. Etc., Etc.

HAMMERMILLS: Williams Nos. 1, 2, 3, 4, 8 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40, Etc.

MILLS: Kennedy Ball 4x6, 5x6 & 5x8. March 8x6 & 10x9. Hardinge 6′x3′, 8′x30″ & 6′x9′. Misc. Tube Mills 5′ & 6′x22′. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.

CRUSHING PLANTS: No. 65 Diamond. No. 22 Pioneer 8x24. 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryers, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices.

(I have equipment at many points in the United States and Canada. What you need may be near your plant.)

ALEX T. McLEOD
7229 Rogers Avenue CHICAGO

Rebuilt Equipment

McMYLER 35-ton Type J Locomotive Crane; 50′ Boom; Air Brakes; Double Drums.
AMERICAN 40 ton 4 Wheel Saddle Tank Type Locomotive.
4 PLYMOUTH 4 ton 24″ Ga. Gas Locomotives.
BROWNHOIST 15 ton Locomotive Crane; 50′ Boom.
VULCAN 8 ton Std. Ga. gas locomotive.
BALDWIN 58 ton 6 wheel switcher, 19x24″ cyl. Walscheart valve gear.
DAVENPORT 22 ton 4-wheel Saddle Tank; Cyl. 11x16.
KOEHRING Model No. 1, ¾ Yd. Comb. Shovel, Crane & Dragline.
ORTON 18 Ton 3 Wheel Loco. Crane 50 ft. Boom; Natl. Bd. Boiler.
P&H Model 330, ¾ Yd. Dragline.
PLYMOUTH 12 Ton 36″ Ga Gasoline Locomotive; Hand Brakes.
WILLIAMS 1 Yd. Clamshell Bucket.

Write for Complete List

SOUTHERN IRON & EQUIPMENT COMPANY
Plant & General Offices
Atlanta, Georgia

Crushers and Screens

Jaw Crushers: 9x15, 9x16, 10x20 and 12x18.
28″x30″ Geared Corrugated Crushing Rolls.
8″ Traylor Bulldog "TP" Gyratory Crusher.
30″ Steel Enclosed Telsmith Rotary Grizzly.
15″x8″—A Jeffrey Swing Hammer Pulverizer.
3x5 1-d. Multirap Dry or Wet Vib. Screen.
3x6 1-d. Plat-O Vib. Screen, with Motor.
3x8 1-d. Link-Belt Vibr. Screen, Belted.
4x5 1-d Hummer Vib. Screen, V-40 Head.
2—4x8 2-d. Perfex Shaker Screens, Belted.
3—4x8 2-d. Gyrex Vibr. Screens, Belted.
120—3x5 and 4x5 New Hummer Ton-Cap Screens.

Conveyors and Elevators

36″ Link-Belt Self-Contained Apron Feeder.
30″x100′ Robins Belt Conveyor Equipment.
30″x32′ L-B Bag Conveyor, on Steel Frame.
24″x60′ Conveyor with Ball-bearing Idlers.
24″ Barber-Greene Reciproc. Plate Feeder.
All Sizes of Head and Tail Pulleys in Stock.
18″ Haiss Digging Bucket Loader, on Wheels.
14″x30′ Jeffrey Open Type Bucket Elevator.
14″x50′ Continuous Belt Inclined Elevator.
2—5″x36′ Encased Belt Bucket Elevators.

Miscellaneous

Air Compressors: 660′, 360′, 173′, Belted.
2-d. Stroudsburg Builders Hoist, 9-hp. gas.
50 and 60-hp. Waukesha Engines, with Clutch.
No. 40 Cletrac 6-cyl. Caterpillar Tractor.
No. 44 Barber-Greene Trenchdigger, 5½′x16″.
Clamshell Buckets: ¾, 1, 1¼, 2½-yds. cap.
12 Centrifugal Electric and Belted Pumps.
800-hp. Kelley Feed Water Heater, and coils.
20′ Span Overhead Traveling Crane, 6-tons.
Cars and Track: 11 Koppel 24″ ga. 1-yd. Cars.

G. A. UNVERZAGT, 15 Park Row, New York City

FOR SALE

SHOVEL—Steam, Marion 100 on Caterpillars; 3½ cu. yd. Dipper excellent condition.

LOCOMOTIVE — Steam, American 40 ton, four wheel, saddle tank, overhauled.

CRANE—Steam, Ohio 20 ton capacity, double drum, bucket operating, 50′ boom, rebuilt.

E. E. FORT
1119 S. 56th St. Philadelphia, Pa.

RAILROAD EQUIPMENT

Hopper Cars Gondola Cars
Flat Cars Box Cars

Freight Car Replacement Parts.
Relaying Rails and Accessories.
We can furnish nationwide service.
Write—Wire—Phone us your inquiries.

HYMAN-MICHAELS COMPANY
122 S. Michigan Avenue
Chicago

Other Offices
Railway Exchange Building,
ST. LOUIS, MO.
625 Market Street,
SAN FRANCISCO, CALIF.
837 E. Gage Avenue,
LOS ANGELES, CALIF.

Jaw Crushers—4″x8″ up to 66″x84″.
Crushing Rolls—16″x10″ up to 54″x24″—Gyratory Crushers
Ring Roll Mills—No. 0 and No. 1.
Swing Hammer Mill.
Rotary Fine Crushers—No. 1, No. 0.
Direct Heat Rotary Dryers—3½′x25′, 4′x30′, 5′x30′, 5½′x40′, 6′x50′, 7′x50′ and 8′x50′.
Semi-indirect heat Dryers—4′x30′, 4½′x26′, 5′x30′ and 8½′x75′.
Cement Kilns—3′ up to 8′ diameter.
Hardinge—Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0 and No. 1 and No. 5 roll
Tube—Rod and Ball Mills—3′ to 8′ diameter
Vibrating Screens—Air Separators.
1—4′x4′ Ball Mill.
New Dryers built for all purposes.

W. P. HEINEKEN
95 Liberty St., N. Y. Tel.: Barclay 7-7298

PRICED TO SELL

A-1 Overh'l'd Condition
Gas "LORAIN" 1¼ yd. SHOVEL
Elec. "LINK-BELT" 2 yd. SHOVEL-and CRANE

MODERN:—
Crushing—Screening—Washing
PLANTS
Designed—Sold—Installed
Wire—Phone—Write

J. SHUMAN HOWER CO., UTICA, N. Y.

USED SPEED REDUCERS

All Sizes — Types — Makes
Conveying Equipment

SAVE 60% OF NEW COSTS

All Materials Overhauled
Guaranteed
SEND FOR OUR STOCK LISTS

Patron Transmission Co.
154 GRAND ST. NEW YORK

WE BUY, REBUILD, SELL OR RENT

AIR COMPRESSORS
Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS
10—1—118 ton Blaw Knox; 2—85 ton Heltzel; 1—60 yard Butler V-60; 1—72 Blaw Knox; 1—46 yd. Johnson offset; 1—60 ton Butler V-40; 2—35 ton Blaw Knox; 1—26 ton Heltzel with Kron-dial scale. All above with or without volume or weigh batchers.
1—Bulk Cement Handling Plant with Johnson 300 bbl. bin. Jeffrey elevators, portable.

BUCKETS
26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.
6—Dragline: 1—1¾ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd. Hayward; 1—¾ yd. Page.
1—1½ yd. Pioneer Cableway Excavator bucket.
7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

CONVEYORS & ELEVATORS
4—Steel frame belt conveyors: 3—18" Barber-Greene 60', 45' & 24'; 1—National 18"x30'.
11—Bucket elevators: Rex and Weller on chain or belt; all sizes.

CRANES, DRAGLINES & SHOVELS
1—Link Belt Mod. K-55 combination dragline and shovel Ser. No. 1698, gasoline power, 70' dragline boom, 2 yd. shovel front.
1—Page, Model No. 411 Diesel crawler dragline, 70' boom, 2 yd. bucket.
1—P & H Model No. 650, Serial No. 4188, 65' boom; 1¼ yd. bucket.
1—Link-Belt K-42, combination shovel, crane and trench hoe. Serial No. 1265, 1¼ yd. shovel front, 60' crane boom.
3—Northwest, Model No. 105, Seri l Nos. 2053, 1645 and 1522, 40' boom, 1 yd. bucket.
1—Link-Belt, K-1, Serial No. 1024, 50' boom, 1 yd. bucket.
2—Osgood Heavy Duty, Serial No. 2069 and No. 2087, combination 1 yd. shovel and crane, 40' boom.
2—Thew, Model "O" combination shovel crane and dragline, Serial No. 2801 and No. 2687, ¾ yd. shovel fronts, 40' crane boom.
1—P & H Model No. 206, 40' boom, ¾ yd. bucket.
1—Byers Bearcat, Serial No. 3299, 30' boom, ½ yd. bucket.

CRUSHERS
6—Jaw Crushers: 1—12 x 26" Champion; 1—12x20" Acme; 2—10"x20" Climax No. 2½; 1—9x16" Telsmith No. 9A; 1—9x15 Champion.
3—Gyratory: No. 5 Gates; 1 No. 3 McCully; 1—No. 0 McCully.
1—Set of Allis Chalmers, smooth type crushing rolls, 42x16".

DREDGE PUMPS
1—12" Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.
3—Belt Driven: 3—Morris Mang., 1—10", 1—8", 1—6".

HOISTS
1—2 yd. Thomas 2 speed Class L Cableway excavator hoist with 150 HP electric motor.
1—1 yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.

WHIRLEY
1—Mod. 75 Wiley Whirley No. 2973, 20 tons cap., 75' boom. 3 D Clyde 80 HP elec. hoist and 30 HP elec. swinger, all complete. Perfect condition.

Send for New Orange Peel Stock List

EQUIPMENT CORPORATION OF AMERICA

1505 Race St., Philadelphia; Phone Rittenhouse 4664 — 1160 S. Washtenaw Ave., Chicago; Phone Nevada 2400 — P. O. Box 933, Pittsburgh; Phone Federal 2000

SPECIALIZING IN —

JAW CRUSHERS
GYRATORY CRUSHERS
CRUSHING ROLLS
SCREENS
RAYMOND PULVERIZERS
HARDINGE MILLS
TUBE MILLS
ROTARY DRYERS
KILNS
AIR COMPRESSORS
CRANES

Your Inquiries Solicited.

BRILL
EQUIPMENT CORP.
183 Varick St.
New York City

REBUILT IN OUR OWN SHOPS

GUARANTEED EQUIPMENT
for
Industrial Plants
Contractors

CRANES, COMPRESSORS, PUMPS, TRACTORS, etc.

ALLEGHENY EQUIPMENT CORPORATION
P. O. Box 1888 — PITTSBURGH, PENNA.

NIXON - HASSELLE COMPANY, INC.
1300 Carter Street
Chattanooga, Tennessee
Phone 6-2109

FOR SALE OR RENT
Guaranteed as Represented

1 Northwest Model 105 Crane, Serial No. 1097, with 45' boom, Climax engine. Needs no repairs, cleaned and repainted.
1 Bucyrus-Erie GA-2 Crane, Serial No. 4229. Needs no repairs.
1 Shovel Attachment for Model 2 Northwest.
1 Jaeger 6" Self Priming Pump. In A-1 condition.
1 Climax Model R-16, 150 h.p. Power Unit, Serial No. 15085. Complete with dual ignition, battery and generator starting, entirely rebuilt.
1 Wisconsin Model K, 6x7, 85 h.p. Power Unit. Rebuilt and in first class operating condition.
2 Wisconsin Model B-3's, 5½x6½, 65 h.p. Need reworking, but complete with all accessories.
1 Cletrac Model F.D., Serial No. 8-Y-014, wide gauge 24" tracks. A-1 condition, track practically new.
1 Cletrac Model F.D., Serial No. 8-Y-020, wide gauge 24" tracks, together with Emsco cable controlled trail-builder and D.D. power unit. A-1 condition.
1 Cletrac Model 40 Gas, Serial No. 1644, rebuilt. New 16" tracks.
1 Cletrac Model 40 Diesel, Serial No. 10292, with Gar Wood Bulldozer. Entirely rebuilt. A-1 condition, standard gauge 16" tracks.
1 Ingersoll Rand 10x8 310' compressor on steel wheels. In good operating condition.
1 Ingersoll Rand 9x8 265' compressor on steel wheels. In good operating condition.
2 Chicago Pneumatic 110' compressors, on steel wheels. In good operating condition.

MACHINERY FOR SALE

90 HP Worthington, type BB-3, four cycle Diesel Engine. 600 rpm, solid injection, with all accessories and spare parts. Belted to Worthington 13½" x 8" x 10" two stage air compressor, 3 step control and tank, 492 cu. ft. at 125 lbs., 300 rpm. New in 1937, used one year.

Other compressors in stock

14" x 8½" x 12" Worthington, 2 stage air compressor, feather valves and intercooler.
14" x 14" Chicago NSB.
11" x 12" Gardner-Denver.
10" x 10" Ingersoll-Rand ER-1, with 3 phase Slip-Ring Motor and tank.

American Hoist and Derrick, 3 drum hoist and swinger, with G-E 80 HP Slip-Ring Motor.

C. G. WYATT MACHINERY
1203 Princess Ave. — Camden, N. J.

Butler concrete batching plant, 5 compts., 105 yds. aggregate, 200 bbl. cement, weighing devices, etc.
225 bbl. Erie bulk cement plant, complete.
155 bbl. Fuller cement bin, electric batcher.
Blaw-Knox 270 bbls. bulk cement plant, complete.
72 ton Blaw-Knox steel bin, portable, 2 compts.
50 ton Blaw-Knox steel bin, portable, 2 compts.
42 cu. yds. Beaumont steel bin, 2 compts.
Pumperete machines, Models 180, 190 and 200.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Gyratory crushers: K.V.S. 30, 37-S, 49; Telsmith S, 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 18x36, 24x36.
Jeffrey type A 30"x24" pulverizer.
Apron feeders, 18"x6', 24"x6', 48"x14', 5'x15'.
Bucket elevator, 32' chain, buckets 8"x6"x12".
Revolving screens, 72"x20', 72"x18', 60"x24'.
Robins 4x8 double deck Gyrex vib. screen.
Telsmith 4'x10' single deck vibrating screen.
Whirley, 25 tons cap., 85' boom, electric.
43-B Bucyrus-Erie Diesel 2 yd. shovel.
41-B Bucyrus-Erie comb, crane and shovel. Steam.
50-B Bucyrus-Erie steam shovel.
Browning 10 ton crane, gas, 40' boom.
Universal 7½ ton truck crane, Mack truck pneumatics.
Lorain 40 truck crane, 8½ tons, 45' bm. Mack truck.
Blaw Knox single line clamshell bucket, ¾ yd.
Haiss clamshell bucket, 1½ yd. rehandling.
Barber-Greene conveyor, 24"x70'.
8 Barber-Greene conveyors, 24"x35', type N.
Barber-Greene conveyor, 18"x60'.
4 I.R. Wagon drills, FM-2, pneumatic tires.
Complete stone washing plant. Write for details.
I.R. Model 50 Leyner drill sharpener.
Gas locomotives, 2½ to 35 tons.
8—Koppel 3 yd. 36" ga. steel V dump cars.
Dredge pumps, 6", 8", 10", 12", 16".
8"x8" cent. Lawrence pump, portable, 35 HP, gas.
8"x6" cent. Barnes pump, portable, 35 HP, gas.
6"x5" Lawrence pump, 20 HP, electric.
4"x4" cent. LaBour self priming pump, 15 HP, elec.
Ing. Rand XCB-2 676 cu. ft. air compressor.
I.R. Type 20, 310 cu. ft. air compressor, Portable.
DeWalt woodworker, 16" circular saw, electric.
Stiff leg derrick, steel, 30 tons, 97' boom.
Steam hoist, 10"x12", 3 drums, Lidgerwood.
Clyde 3 drum electric hoist & swinger, 75 HP.
Lidgerwood, 2 drums, swinger, gas hoist, 75 HP.
Sauerman two drum dragline Hoist, 75 HP, gas.

30 Church St. — **RICHARD P. WALSH CO.** — New York, N. Y.

CRUSHERS—ELEVATORS—SCREENS
SAND WASHERS—PUMPS
CONVEYORS

1—7½"x13" CHAMPION No. 3 Jaw Crusher.
3—BRAND NEW Jaw Crushers 9"x15" and 10"x20".
1—9"x16" CLIMAX No. 2 Jaw Crusher.
1—12"x26" CHAMPION No. 6 Jaw Crusher.
1—No. 19 KENNEDY Fine Reduction Crusher.
1—No. 1 STURTEVANT Ring Roll Mill.
1—Pr. 24"x14" WEBB CITY Crushing Rolls.
1—48" dia. x 18' Allis-Chalmers trunnion mounted Screen with steel frame.
2—M-20 QUAKER CITY Hammer Mills.
1—No. 2 MEAD Disc Mill.

JOHNSON AND HOEHLER, INC.
Lansdowne, Penna.

SYNCH. MOTOR GENERATORS

750 KW WEST.,	250 V.,	2400 A.C.,	900 RPM
300 KW G.E.,	250 V.,	2300/4000 A.C.,	1200 RPM
200 KW G.E.,	250 V.,	2300/4000 A.C.,	1200 RPM
200 KW G.E.,	550 V.,	2300/4000 A.C.,	1200 RPM
150 KW WEST.,	250 V.,	2300/4000 A.C.,	1200 RPM
100 KW G.E.,	250 V.,	2300 A.C.,	1200 RPM

SYNCH. CONVERTERS

300 KW G.E.,	250 V.,	1200 RPM, 2300/4000 V. AC
300 KW WEST.,	250 V.,	1200 RPM, 2300/4000 V. AC
200 KW G.E.,	250 V.,	1200 RPM, 2300/4000 V. AC
200 KW WEST.,	250 V.,	1200 RPM, 2300/4000 V. AC
200 KW R.W.,	250 V.,	1200 RPM, 2300/4000 V. AC

Each unit listed above is owned by us and is available for inspection and immediate shipment.

WHAT HAVE YOU FOR SALE?

WALLACE E. KIRK COMPANY
Incorporated
502-E Grant Building — Pittsburgh, Pa.

STEEL CLOTHES LOCKERS
STORAGE CABINETS—BAR RACKS

Here is your opportunity for a **REAL BUY.** We have acquired several thousand **NEW** all steel **CLOTHES LOCKERS. Padlock Type, Flush Bottom,** in two sizes. A, **12x15x66"** overall in sections of three wide, at **$4.27** per door opening. B, 15x18x72", two wide at **$5.47** per door opening. Shipped erected. Padlocks, 22c each extra. **STORAGE CABINETS,** size 36x18x72" overall, with lock at **$16.75. BAR AND PIPE RACKS** 51" high—13" wide, has four 16" wide inside spaces, capacity 10,000 lbs., price **$16.75** per pair. All of this equipment sold f.o.b. Cars N. Y. Wire your order, for these are selling fast. You may deduct 5% if your check accompanies order.

NEW YORK MACHINERY CO.
Dept. P. Q., 17 W. 20th St., New York

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

A. F. MILLER

CONSULTING ENGINEER

108 Second St. Jackson, Mich.

INVESTIGATIONS, REPORTS, DESIGNS, MODERNIZATION, ETC., RELATING TO THE PORTLAND CEMENT INDUSTRY.

FOR SALE—A Good Time to Buy

Crushers—Gyr. 7½K—8K—Jaw 10x36—Rolls 42x16.
Loco. cranes steam RR 50 ton—40 ton—30 ton.
Crushers 3′ cone-pul. 30x42—18x24—jaw 48x60.
Grader 6 wh. Austin-crane truck MacUniv.
Screw washer Link-Belt—vib. screen 4x7 Jeff.
Rotary kilns 8x125—bucket elevators 95x24.
Crushers jaw 66x86—60x84—dryers 4′x30′.
Locos. 5 switchers 6 wh. 80 ton.
Cars—100 side dumps 20 yd. steel.
Draglines—Page 220-Cl. 24-55B-4W-5W Lima 450.

A. V. KONSBERG, 111 W. Jackson Blvd., Chicago

RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money. 'Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

O. C. HOFFMAN, Pres. L. H. HOFFMAN, Treas.

DIAMOND CORE DRILLING

HOFFMAN BROS. DRILLING COMPANY
PUNXSUTAWNEY, PA.

We drill for any mineral. We have more than forty steam, electric and gasoline drills, adapted for any job. Satisfactory cores guaranteed. Our prices are right.
Established 1902 - - - - - Telephone No. 382

Royal E. Burnham

Attorney at Law

•

Patent and Trade-Mark Causes

•

511 Eleventh Street, N. W.
WASHINGTON, D. C.

COVERED HOPPER CARS, 50-TON

With hatchway roof and bottom discharge
1528 cu. ft. Unusual condition
Price very reasonable
All other types of Freight Cars, too

IRON & STEEL PRODUCTS, INC.
Chicago (Hegewisch Sta.) Illinois
Anything containing IRON or STEEL

WE LOOK INTO THE EARTH

By using Diamond Core Drills We drill for Limestone, Gypsum, Talc. Fire Clay. Coal, and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

FOR SALE

2—Link-Belt dewatering elevators, 36′ centers, complete with all steel supporting structure and drive machinery.
2—Strut bar, revolving, scalping screens, 48″ diameter, 12′ long, with drive machinery.
1—Sauerman, 2 cu. yd. capacity, slackline, electric hoist with 150 H.P. motor and starting equipment.

TERRE HAUTE GRAVEL COMPANY
Terre Haute, Indiana

WANTED: Additional Lines

Machinery representative and sales engineer at Akron, Ohio, seeks to represent manufacturer of portable conveyors and other sand, gravel and crushed stone equipment in the state of Ohio. 20 years' experience among pits, quarries and power plants. Address

Box 308
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WANTED TO BUY—

Used Gyratory type Crusher
Approximate size 30″

Box 316
PIT AND QUARRY PUBLICATIONS
538 So. Clark Street Chicago, Illinois

FOR SALE

9″ x 21″ Wheeling Jaw Crusher and 22′ bucket elevator. In good condition.

H. W. TAYLOR COMPANY, Inc.
19 S. Senate Ave.
Indianapolis Indiana

Wanted

(1) 8″ and (1) 13″ A.C. Superior McCully Red Crushers.
(1) 2 W. Monighan Walker dragline, Diesel, late walkers. $4000.00.

For Sale

(1) brand new Hercules OXC Power Unit, including twin Disc Clutch, 35 H. P. $275.00.
(1) 225 H. P. Sterling Power Unit, rebuilt, new cylinders, heads, pistons, etc. $1400.00.

M. WENZEL
Route 5 Kansas City, Kans.

WANTED

USED, MOBILE GASOLINE-ELECTRIC HOIST
for block plant.

RAPPL AND HOENIG COMPANY
1441 Ridge Rd. E.
Rochester, N. Y.

Jaw, Roll and Cone Crushers, all sizes.
8A, 10B, 32B & 40B Telsmith, 19 & 49 Kennedy.
No. 3, 4, 6 TZ Traylor Gyratory Crushers.
Swintex Cutters 25′, 8″-50′, 10″-45′, 15″ pipe.
6, 8, 10 & 12″ Sand & Gravel Pumps, other centrifugals.
Conveyor Equipment 14″-36″, belt and Portable.
Barber-Greene Loaders, Models 42, 42A, 57 & 82.
Vibrating and Rotary Screens, all types and sizes.
2-18 ton, 2-21 ton Davenport 36″ ga. Locos.
Gasoline Locos—all weights and gauges. Dump Cars.
1½ yd. Page—"C" Dragline Bucket. Ask for Bulletin #49.
185 HP Venn Severin 3 cyl. Diesel Rebuilt.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa. 2290 St. Louis, Mo.

SAVE

Bolted type steel bins will cost you less erected than ordinary wood bins.

New and Used Pipe and Tubing

Jos. Greenspon's Son Pipe Corp.
Natl. Stock Yds. (St. Clair Co.) Ill.

WANTED

Young college trained Mining Engineer, several years underground mining experience, for position in the southeast. Give full details concerning qualifications, experience, salary expected, recent photograph.
Send replies to

BOX 312
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

LOW PRICES—GOOD EQUIPMENT

1—22 ton Browning steam locomotive crane, 50′ boom.....$3900.00
1—35 ton Browning steam locomotive crane, 60′ boom.....$4300.00
1—20 ton standard gauge Milwaukee gas locomotive.....$2800.00
2—8 ton Whitcomb locomotives, 24″ gauge.....$ 500.00 ea.

HUNTER TRACTOR & MACHINERY CO.
Milwaukee Wisconsin

FOR SALE

Waukesha Model HLU 4 cylinder 87 H.P. 6 x 6½ gasoline engine, skid mounted with sheet metal hood, air, fuel and oil filter, clutch, gas tank and belt pulley. Practically new. Excellent condition.

O. B. AVERY COMPANY
1325 Macklind Ave. St. Louis, Mo.

FOR SALE

100 yd. per hour Austin-Western Portable Washing plant.
9x24 Pioneer Portable Crushing plant.
30 Caterpillar Tractors with Bulldozer.
15 Caterpillar Tractors.

F. W. HERKEL
3621 Kenilworth Ave. Berwyn, Illinois

25 & 35 ton Plymouth Gasoline Locomotives.
10x36 Gruendler Steel Frame Jaw Crusher.
3½ yd. Northwest No. 3 Gas Shovel & Dragline.
P&H 1 yd. & 1¼ yd. Cranes and Draglines.
80, 100, 120, 180, 240 HP Fairbanks Morse and Atlas Diesels, generators if required.
2—100/150 HP Buda 6 cyl. Power Units.
1 yd. Owen type D digging clamshell bucket.
150 HP Scotch Marine type Boiler. Retubed.
All Sizes—Crushers—Shovels—Cranes—Compressors.

MISSISSIPPI VALLEY EQUIPMENT CO.
501 Locust St. St. Louis, Mo.

FOR SALE

8 Ton Stiff-leg steel derrick of unusually fine design. 79 foot mast; 71 foot boom with swing of 300 degrees, therefore covers large area without use of guy-wires. Mounted with triangular latticed steel back legs with connections for concrete anchorage. Swinging gear, hoisting drums operated by electric motor, but can be bought without drums.

NEW ENGLAND STRUCTURAL CO.
310 Second St. Everett (Boston), Mass.

FOR SALE

BARGAIN ARC WELDERS

New, used, demonstrators. Budget Plan—Rental Plan—30 DAYS TRIAL. Write for FREE book and bargain list.

HOBART BROS. CO.
Box PQ-340 Troy, Ohio

RELAYING RAILS

All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.

M. K. FRANK
480 Lexington Ave., NEW YORK CITY
25 St. Nicholas Bldg., PITTSBURGH, PENNA.

FOR SALE

1—Standard 20 ton truck scale, 9x20 platform with steel, $250.00.
1—Walker Elliott Rotary Crusher for crushing 8″ lumps, soft material to ½″, $200.00.

G. & W. H. CORSON
Plymouth Meeting Pa.

WILL SACRIFICE

375 KVA generator set, complete with Westinghouse A.C. generator direct to four cylinder Diesel engine. Used seven months. Address

Box No. 320
PIT AND QUARRY PUBLICATIONS
538 S. Clark St., Chicago, Illinois

PRICED FOR QUICK SALE

1—48" Symons Horizontal Disc Crusher (Nordberg Mfg. Co.), completely overhauled, rated capacity 1" product, 45-60 T.P.H. $1 000.00

1—8" Allis-Chalmers Style N Gyratory Crusher, No. 7715, like new; used only one season. Manganese fitted, non-choking concaves, smooth head for fine crushing, extra head for coarse crushing $850.00

1—No. 2 Allis-Chalmers Gyratory Crusher, manganese fitted $250.00

1—Allis-Chalmers Eccentric with manganese steel gear for No. 5 style K crusher, like new. $150.00

1—30"x16" Wis. Foundry Crushing Rolls. . . $450.00

1—24"x14" Wis. Foundry Crushing Rolls. . . $275.00

Several Vibrating Screens, Bucket Elevators, Sand Classifiers, Electric and Gasoline Motors, 2", 3", 4", 6" Self-priming centrifugal pumps with gasoline motors; 1½", 2", 3", 4", 6" centrifugal pumps with electric motors.

1—Portable Air Compressor, on pneumatic tired wheels, 160 c.f.m. actual air.

1—Portable Air Compressor, on pneumatic tired wheels, 105 c.f.m. actual air.

Above compressors are like new, have been used only a few months.

1—Link-Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42.

1—Northwest ¾ yard Shovel Boom Assembly for Model 104-105.

1—P&H ¾ yard Shovel Boom Assembly for Model 206.

LIPPMANN ENGINEERING WORKS
4603 W. Mitchell Street — Milwaukee, Wis.

SPECIAL OFFERING
of Standard Gauge
Saddle Tank Locomotives

All Thoroughly Reconditioned

Four—14x22" American 40 Ton.
One—15x22" Porter 40 Ton.
One—14x20" Porter 36 Ton.
One—14x20" Vulcan 36 Ton.
One—13x18" Porter 32 Ton.
One—12x18" American 26 Ton.

Very Attractive Prices

Also have large stock all industrial types, steam and gasoline.

Complete Stock List on Request.

BIRMINGHAM RAIL & LOCOMOTIVE COMPANY
Birmingham — Alabama

FOR SALE
USED EQUIPMENT

10x20 DIAMOND Roller Bearing Jaw Crusher.
10x36 DIAMOND Roller Bearing Jaw Crusher.
15x36 DIAMOND Roller Bearing Jaw Crusher.
2'0"x4'0" single deck DIAMOND vibrating screen.
6 to 8 HP model MRP3 LeRoi Engine.
Model No. U-40 Allis-Chalmers Engine.
4" Sterling Sand pump No. 3558.
60"x20'x0" Revolving screen — Structural frame on wheels.

NEW EQUIPMENT

1—DIAMOND 9x16 Bronze Bearing Jaw Crusher mounted on truck with 15-20 HP engine.
3'0"x8'0" Triple deck Diamond Vibrating Screen.
21-Cu. yard jack leg bin.
Special Price for quick sale.

DIAMOND IRON WORKS, INC., AND THE MAHR MANUFACTURING COMPANY DIVISION
Minneapolis — Minnesota

REAL BARGAINS IN PUMPS

American Wells Works, Pump, type KT4NB 6", 1,000,000 gals. per day, at 325 ft. total head, 3-stage unit.
American, vertical pump, 2400 G.P.M. at 30 ft. head, with 40 HP vertical motor.
Union Steam Pump, 500 G.P.M. at 140 ft. head, double suction.
Gould, 450 G.P.M. centrifugal, at 50' head.
1000 G.P.M. 45 ft. head Dayton Dowd centrifugal pump.
1200 G.P.M. 110 ft. head Allis-Chalmers.
850 G.P.M. 243 ft. head Allis-Chalmers.
All rebuilt. Ready for prompt shipment.

Write—Phone—Wire!

CHICAGO ELECTRIC COMPANY
1334 W. 22nd St. — Chicago, Ill.

STANHOPE OFFERS!

AIR COMPRESSORS
BELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1722 & 2850 Ft.
DIESEL: 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300 & 2200 Ft.

BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
5 Owen & Bucyrus Rock Grabs.
CLAMSHELL: ½, ¾, 1, 1½ & 2 Yds.
ORANGE PEEL: ¾, 1, 1½, 2 & 3 Yds.
DRAGLINE: ¾, 1, 1½ & 2 Yds. Cap.

CRANES & DRAGLINES
5 Ton BROWNHOIST, 30 ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
16 Ton Speedcrane, Gas., 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
2½ Yd. Lorain Model 95, Diesel Dragline.

CATERPILLAR SHOVELS
1½ Yd. P. & H. Gas & ¾ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1½ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel

DUMP CARS
46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5'x22" HARDINGE CONICAL Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x6, & 10x9 Straight Ball Mills.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x18, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 5x12 and 6x12 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Linck.
5½x18 P & M Tube Mill Silex.

PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x16 Allis Chalmers Double Roll.
36x20 Diamond Double Roll.
24x14 Pioneer Double Roll.
24x12 P & M Double Roll.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
30x10 Gruendler Roller Bearing.

CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
4—10 TZ Traylor 4 Ft. Gyratory.
4—Nos. 5, 5½ & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullus.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.

HAMMER MILLS
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Gruendler No. 6X.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2

STEEL BINS
72 Ton BLAW-KNOX 2 Compt.; also 250 ton.
100 Ton BLAW-KNOX 2 Compt.

CEMENT BIN
400 Bbl. Portable BUTLER Bulk Cement Bin with Fuller Full Automatic Electric Push Button Weigh Batcher.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt
150 K.W. GEN. ELEC. 3/60/2200-250-275 volt
200 K.W. RIDGWAY 3/60/2200-250-275 v., 900 rpm.

SLIP RING ELECTRIC MOTORS
52 H.P. GEN. ELEC. 3/60/220-440 v., 1200 rpm.
(3) 100 H.P. GEN. ELEC. 3/60/220-440 v., 900-1200 rpm.

RUBBER HOSE
Air: ¼ in. to 1¼ in. Water: ¾ in. to 10 in.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 ft. 24 In., 30 In. & 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 8x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72. HUMMER, ROTEX, NIAGARA & ROBINS, LINK BELT & HURON.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20.

SAND WASHERS AND CLASSIFIERS
4 LINK-BELT A-60 In. Classifiers.
7 ALLEN Cones 4 Ft., 5 Ft., 6 Ft., 8 Ft. TELSMITH 13 Ft. by 2 Ft. 8 In. Screw Washer.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1— ¾ yd. Gas — 1—1½ yd. Electric
1—1 yd. Electric 3—2 yd., 3 yd. & 4 yd. Electric

R. C. STANHOPE, INC.
(Cable Address: "STANEQUIP" New York)
875 6TH AVENUE, NEW YORK, N. Y.
Pennsylvania 6-3565 or 6-3566

CRANES - SHOVELS

2—Northwest No. 4 Gas Cranes and Draglines, Nos. 3793 and 3489, 50-60-70' Bms., excellent condition.
1—13-ton cap. Lorain Truck-Crane, 40' Bm. 3-axle Mack Truck, pneumatic tires, new June 1939, like new.
1—Lorain 75-B Gas Shovel and Crane No. 4968, 1¼ yd., 45' cr. bm. excellent cond.
1—Lorain-77 Diesel Shovel 1½-yd. 1937.
1—Lorain-80 Diesel Shovel 1¾ yd. 1939.
1—Koehring-301 Gas Shovel No. 1183 1 yd.
1—Marion-21 Electric Shovel ¾ yd.
1—Type-B Erie Steam Crawler Shovel.
1—Byers "Bulldog" full rev. Gas Backhoe and Crane, new 1931, 2 Backhoe buckets 25" and 37" wide, 45' boom.
1—Haiss Model-27 Creeper Loader, 4-cyl. Gas Motor on Crawlers, bargain.
1—Northwest No. 4 Backhoe attachment 47" bucket, first class cond.
1—Lorain-40 Truck-Shovel attachment ¾ yd. Like new.

GREY STEEL PRODUCTS CO., INC.
74 Central Ave., Glen Rock, N. J.
Tel. Ridgewood 6-2275

FOR SALE or RENT

LORAIN 75-A 1¼ yd. Shovel No. 3929.
Northwest No. 105 1 yd. Shovel No. 1540. $1850.00
Northwest Mod. 18 1½ yd. Shovel No. 4408. Like New.
Bucyrus-Erie GA-2 1¼ yd. Shovel No. 4046. $1750.00
Lima No. 101 15 ton Crane. Excellent Condition.
P&H Model 400 ¾ yd. Shovel No. 3953. Rebuilt.
3—Link-Belt K-55 Draglines 70' Boom.

SPECIALS

2—Chicago-Pneumatic 15x9x10 Compressors direct con. Benz 40D 120 HP Diesel Eng. 664' ea. Like New, comp. with all accessories and ready to work. Ingersoll-Rand, Mod. 420 Portable. Actual Cap. 413' at 100 lb. Used less than SIX MONTHS. New Guarantee. Bargain.
Whitcomb 4 ton Gas Loco., 24" Ga. Like New. $395.00
2—Whitcomb 6 ton Gas. Loco. 24" Ga. Good. $350.00 ea.
2—Owen ¼ Type M Clamshell. Almost New.
1—Hayward 1 yd. Rehandling Clamshell.
30—C.P. No. 5 DRIFTERS comp. with shells and screws. $100.00

CHARLES DREIFUS COMPANY
Widener Building — Philadelphia, Pa.

SURPLUS EQUIPMENT

CRANES
1—10 Ton Gasoline Type, on Caterpillars.
3—20 Ton Locomotive Type, Standard Gauge.
1—30 to 40 Ton Locomotive Type, Standard Gauge.

ELECTRICAL EQUIPMENT
3—300 K.W. G.E. Rotary Converters.
1—300 K.W. G.E. Switchgear, Semi-Automatic (new).
3—300 K.W. G.E. Transformers.

GOLD MACHINE (In Wyoming)
1—Complete Ainley Placer Gold Machine, 4 Bowl, Dragline Operation.

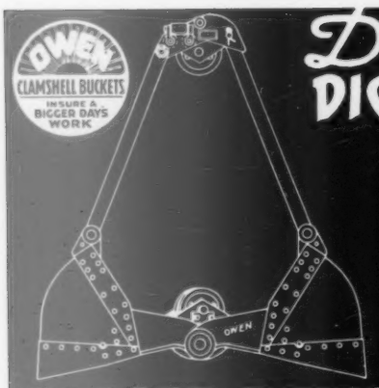
LOCOMOTIVES (Steam)
4—51 Ton Baldwins, 17x24, Standard Gauge.
1—60 Ton American, 20x26, Standard Gauge.
2—77 Ton Baldwins, 19x26, Standard Gauge.
4—80 Ton Porters, 22x26 Standard Gauge.
1—80 Ton Baldwin, 22x26 Standard Gauge.

SHOVELS (Diesel, Electric and Steam)
1—½ Yd. Thew Electric Type S, Mining Crawler Type.
1—3½ Yd. P & H Diesel 900, on Caterpillars.

175—20 Yd. Steel and Wood Koppel and Western Dump Cars, Standard Gauge.

PUMPS (Steam)
7—Camerons, 49 to 248 G.P.M.
1—Prescott Duplex, 8x5x10.

BUTLER BROTHERS
Producers of Iron Ore
137 East 8th St. — St. Paul, Minn.



Distinctive DIGGING FACTORS

CORRECTLY proportioned as to width and length—endued with exceptional closing power—Owen Buckets cover a large area, dig deeply for "a bigger bite" and "clean up" move rapidly.

BIGGER BITES AND Faster CLEAN-UP

THE OWEN BUCKET CO.
6050 BREAKWATER AVE., CLEVELAND, O.
BRANCHES: New York, Chicago, Philadelphia, Berkeley, Cal.

A MOUTHFUL AT EVERY BITE

Index to Advertisers

Allegheny Equipment Corp 109
*American Cable Div. American Chain & Cable Co., Inc ... Inside Back Cover
*American Chain & Cable Co., Inc. Inside Back Cover
*American Pulverizer Co 103
Anchor Concrete Machy. Co 90
Atlantic Equipment Corp 107

Bacon, Inc., Earle C 66
*Barber-Greene Co 23
Barrett-Cravens Co 91
*Bay City Shovels, Inc 24
Bethlehem Steel Company 18
Birmingham Rail & Locomotive Co. 111
*Blaw-Knox Co 91-94
Bristol Company, The 102
Broadcast Section 105-111
Brooklyn Contractors Machy. Exchange, Inc 107
*Brooks Equipment & Mfg. Co 61
*Bucyrus-Erie Co 22
*Bucyrus-Monighan Co 22
*Buell Engineering Co., Inc 9
Burnham, Royal E 110
*Butler Bin Co 100
Butler Brothers 111

Caterpillar Tractor Co. ... Back Cover
Chain Belt Co 88
*Chicago Bridge & Iron Co 91
Chicago Perforating Co 62
Chicago Pneumatic Tool Co 102
*Cincinnati Rubber Mfg. Co 68
Cleveland Wire Cloth & Mfg. Co ... 112
Commercial Shearing & Stamping Co., The 88
Consolidated Products Co 105

Davenport Locomotive Works 100
*Deister Concentrator Co 63
Deister Machine Co 69
*Dempster Bros., Inc 10
*Diamond Iron Works, Inc 104
*Dixie Machy. Mfg. Co 72
Dixon Valve & Coupling Co 69
Dreifus Co., Charles 111
Dunn Mfg. Co., W. E 93

*Eagle Iron Works 19
*Easton Car & Constr. Co 5
*Ensign-Bickford Co., The 97
Equipment Corporation of America 109

Fitler Co., The Edwin H 71
Flexible Steel Lacing Co 4
Frog, Switch & Mfg. Co., The 66
*Fuller Co 104

Goodyear Tire & Rubber Co 2
Grey Steel Products Co., Inc 111
*Gruendler Crusher & Pulverizer Co. 68

*Haiss Mfg. Co., Inc., Geo 72
Hardinge Co., Inc 60
Harnischfeger Corp 101
*Hendrick Mfg. Co 100
Hetherington & Berner, Inc 103
Hoffman Bros. Drilling Co 110
Hotel Philadelphian 92
Hower Co., J. Shuman 108

Industrial Brownhoist 104
Iowa Manufacturing Co 6-7

*Jackson & Church Co 94
*Jaeger Machine Co 95
*Jeffrey Mfg. Co 11

Kansas City Hay Press Co 99
Kent Machine Co 90

Laughlin Co., The Thomas 67
*Le Tourneau, Inc., R. G 1
Lewis, Harry C 108
Lewistown Foundry & Machine Co 100
*Lima Locomotive Works, Inc 10
*Link-Belt Co 103
Lippman Engineering Works 111
Louisville Drying Machy. Co 8
Ludlow-Saylor Wire Co ... Inside Front Cover

Marion Steam Shovel Co., The 17
Marmon-Herrington, Inc 99
*McLanahan & Stone Corp 99
McLeod, Alex T 108
Miles Mfg. Co., The 94
Miller, A. F 110
*Morris Machine Works 99
Mortarless Tile Machine Co., Inc. 91
*Multiplex Concrete Machy. Co 92

National Supply Co., The 21
*National Wire Cloth Co., Inc 99
Naylor Pipe Co 8
New Holland Machine Co 71
Nixon-Hasselle Co., Inc 109
*Nordberg Mfg. Co 98

Osgood Company, The 66
Owen Bucket Co., The 112

Page Engineering Co 67
*Parsons Engineering Corp 64
Pennsylvania Drilling Co 110
*Pioneer Engineering Works 99

Quaker Rubber Corp 20

R. & L. Concrete Machy. Co 90
Ransome Concrete Machy. Co 73
*Raymond Pulverizer Div. of Combustion Engineering Co., Inc 14
Republic Rubber Div. of Lee Rubber & Tire Corp 13
*Robins Conveying Belt Co 26
*Roebling's Sons Co., John A 15-59
Rogers Iron Works Co 72

*Sauerman Bros., Inc 100
Screen Equipment Co., Inc 66
Simplicity Engineering Co 99
*Sly Manufacturing Co., The W. W. 62
*Smidth & Co., F. L 104
Smith Engineering Works 12-61
*T. L. Smith Co., The 92
Southern Iron & Equipment Co 108
Southern Materials Corp 108
Sprout, Waldron & Co., Inc 104
Standard Stamping & Perforating Co 104
Stanhope, Inc., R. C 111
*Stearns Mfg. Co 96
Stulz-Sickles Co 99
Superior Engine Division The National Supply Co 21

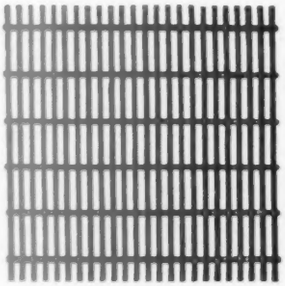
Taylor Forge & Pipe Works 65
Thew Shovel Co., The 3
*Traylor Engineering & Mfg. Co 101
Twin City Iron & Wire Co 104
*Tyler Co., W. S., The 64

Union Wire Rope Corp 103
United Hoisting Co., Inc 108
*Universal Crusher Co 65
Unverzagt, G. A 108

Walsh Co., R. P 109
*Warren Bros. Roads Co 101
Wellman Engineering Co 70
Wyatt Machy., C. G 109

Zagelmeyer Cast Stone Block Machy. Co 92

***See also Detail Information in the 1940 Pit and Quarry HANDBOOK**



Rolled Slot

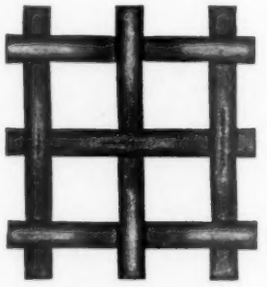
ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

THE CLEVELAND WIRE CLOTH & MFG. COMPANY
574 E. 78th St. CLEVELAND, OHIO

GIVE ME AMERICAN CABLE TRU-LAY PREFORMED Every Time—

1 It resists kinking
2 It spools better
3 It requires no seizing
4 Broken crown wires lie flat and in place
5 It is easier and safer to handle
6 It reduces unproductive shutdowns
7 It lasts longer—gives better service
AMERICAN CABLE
TRU-LAY Preformed
WIRE ROPE

GREEN SIGNIFIES SAFETY

"Whenever my ropes must operate over sheaves or drums . . . then I want American Cable's TRU-LAY Preformed. It has greater fatigue resistance; lasts longer; is easier to work."

So say thousands of operators from every industry. Nor do they say and believe that just because *we* insist upon it in magazine advertisements. They *know* from actual field and plant experience extending over a period of years.

Join the rapidly increasing ranks of industrial money and time savers by specifying American Cable's TRU-LAY Preformed. *All* American Cable's Wire Ropes made of Improved Plow Steel are identified with the Emerald Strand.

BUY ACCO QUALITY—*whether in American Cable Division's Ropes—American Chains (Weed Tire Chains and Welded or Weldless Chains)—Campbell Abrasive Cutting Machines—Page Wire Fence—Page Welding Wire—Reading-Pratt & Cady Valves—Wright Hoists or any other of the 137 ACCO Quality Products.*

AMERICAN CABLE DIVISION
WILKES-BARRE, PENNSYLVANIA
District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, Inc.

Largest crushing plant in West uses low-cost "CATERPILLAR" DIESEL POWER

They don't come too big for "Caterpillar" Diesel Engines!—as this huge Pioneer crushing plant of McNutt Bros., Eugene, Ore., shows. Two D13000 Engines drive primary crusher and 40 x 22 rolls, screen on top of 5-compartment bin and three conveyors. A D17000 Engine drives the 54V plant. Fuel cost, as every one knows, is so low with "Caterpillar" Diesels that the savings from this item alone pile up fast as the days, weeks and months roll by. Yet this isn't the only source of profit these simple, sturdy, dependable engines create:

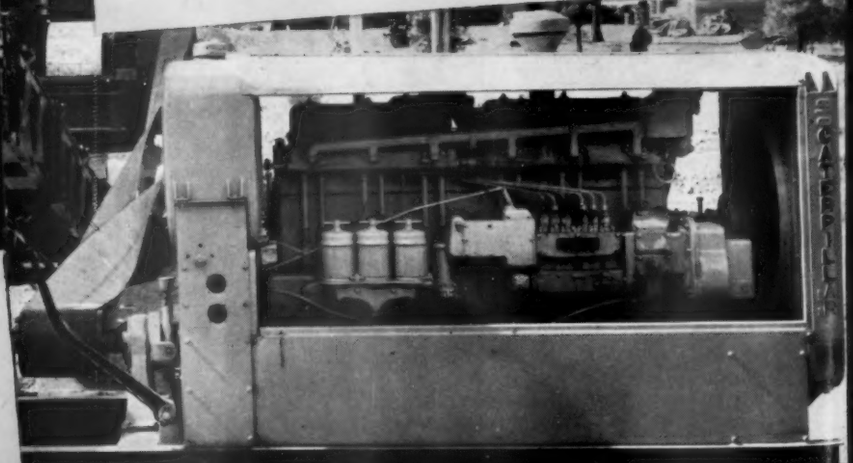
- They're compact—readily set up or moved.
- They help to keep operations close to source of raw material and to destination of finished product (keeping hauls short).
- They're durable—"tough"—ruggedly constructed of high-quality materials, and thoroughly protected by dust seals and positive lubrication.
- They require no specially trained attendant—any employee can quickly learn to look after their needs (no delicate adjustments nor frequent check-ups).
- With normal care, they require little maintenance—can keep going twenty-four hours a day for long stretches.
- They incur no long delays or lay-up for repairs or overhaul—being backed by the most complete, widespread and readily available replacement-parts and service facilities of any engines in the world.
- Their long serviceable life (proved by thousands of actual records in every industry) spreads purchase-cost and depreciation write-offs thinly over the years.

- Crushers, screens, washers; compressors for rock-drilling; shovels and bulldozers for removing overburden; cranes for quarrying and loading; tractors and locomotives for hauling—all do their jobs *better, quicker, cheaper* with "Caterpillar" Diesel Power. A COMPLETE RANGE OF ENGINE SIZES—34 to 180 horsepower. See nearest "Caterpillar" dealer, or write direct for free literature.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES • DIESEL-ELECTRIC SETS
TRACK-TYPE TRACTORS • ROAD MACHINERY

LIGHT YOUR NIGHT OPERATIONS, POWER YOUR TOOL SHOP—with one of these new low-priced, small-size "Caterpillar" Diesel-Electric Sets. Simple, complete, compact, self-regulating. No complicated outside control apparatus. 13 to 66 kw. Electricity for as little as 1 cent per [illegible] hours (depending on average load and local price of Diesel fuel).